5705

M42 Duster

Walk Around ®

David Doyle

Color Series

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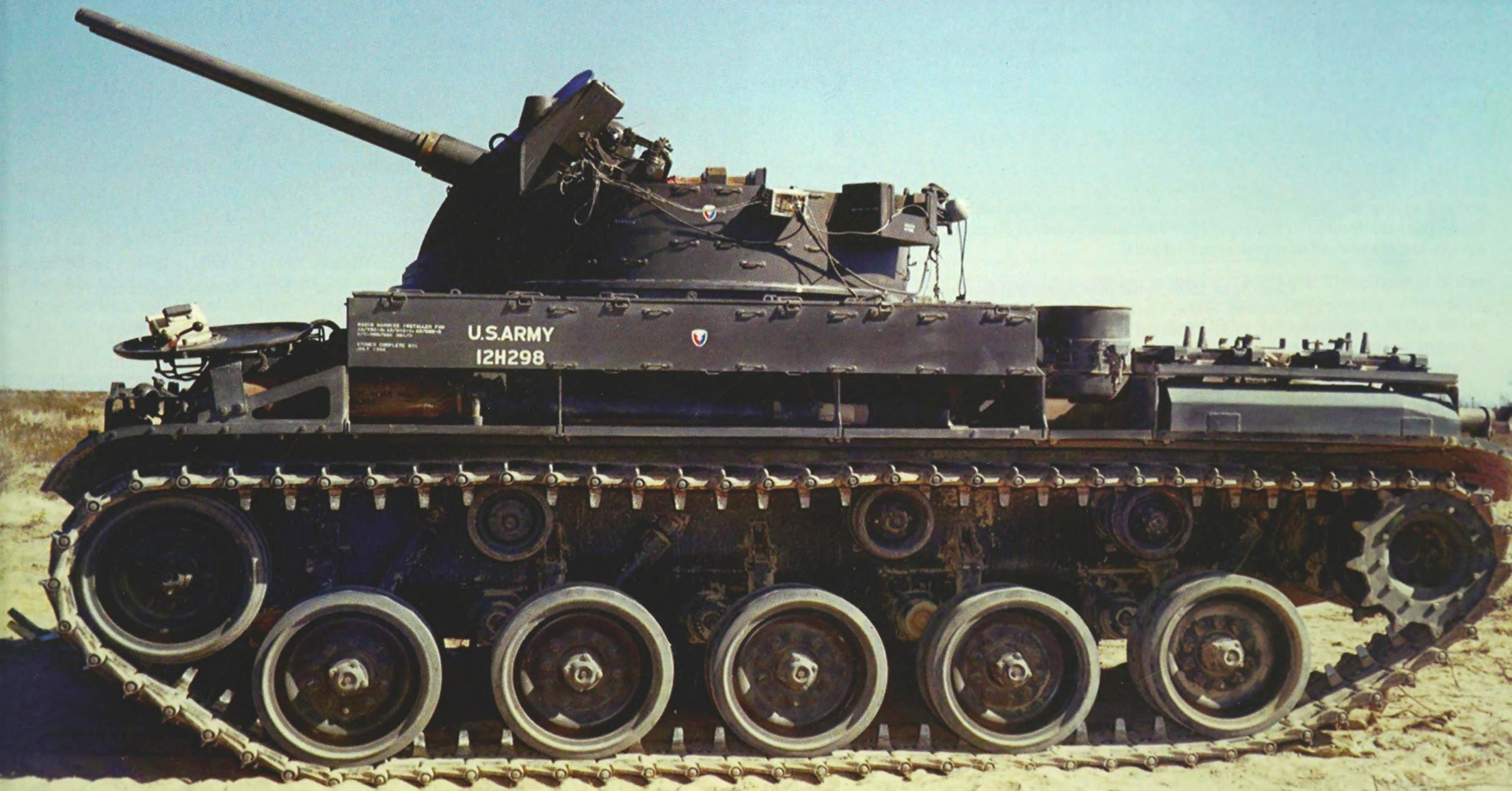
David Doyle



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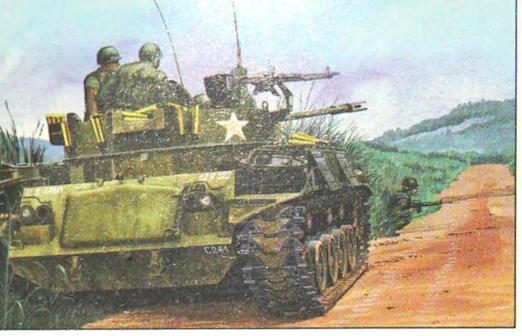

(Front Cover) 13 January 1968—An M42 Duster parks on the side of a road at Ca Lu in Vietnam.

(Back Cover) Duster of C Battery, 1st Battalion, 44th Artillery, fires at night from Hill 250 near Khe San.

(Title Page) An M42A1 Duster sits on the dusty plains of Fort Bliss, Texas—the Air Defense Artillery School's home. (ADA Ft. Bliss)

About the Walk Around/On Deck Series

The Walk Around/On Deck series is about the details of specific military equipment using color and black-and-white archival photographs and photographs of in-service, preserved, and restored equipment. "Walk Around" titles are devoted to aircraft and military vehicles, while "On Deck" titles are devoted to warships. They are picture books of 80 pages, focusing on operational equipment, not one-off or experimental subjects.

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ISBN 978-0-89747-558-7

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Acknowledgements

This book would not have been possible without the generous assistance of Randy Withrow and his staff at the Veteran's Memorial Museum in Huntsville, Alabama; Fred and Lani Ropkey and Skip Warvel at the Ropkey Armor Museum in Crawfordsville, Indiana; Louis and Angela Kisded of the American Legion Post 64, Heber Springs, Arkansas; the TACOM LCM History Office; Stuart Robinson; Dennis Spence of Portrayal Press; John Adams-Graf, Denise and Brandon Moss, and Jeff Symanski.

Introduction

World War II (WWII) ended any doubt about air power's impact on ground combat. As a result, the military expended considerable effort in antiaircraft defense during and after the war. One of the most noteworthy WWII antiaircraft weapons for both Allied and Axis forces was the Bofors 40 mm antiaircraft gun. The Bofors is most memorable in Allied service for its naval use in quadruple mounts. However, ground forces used the gun as well. Both towed and self-propelled weapons were used. Arguable, the pinnacle of U.S. self-propelled development in WWII was the M19 Gun Motor Carriage, which featured a dual-cannon mounting.

Lessons learned during WWII spurred the development of a new range of tactical vehicles during the immediate postwar era. Considerable effort was devoted to standardizing even the most mundane components, vastly simplifying logistics, and improving overall performance. The outbreak of the Korean War and the associated fear that Korea would escalate into World War III accelerated the development and production of a new generation of vehicles.

In 1951, the Army began upgrade development for the M19 system. The M42 resulted. Because it was a member of the M41 family of armored vehicles, the M42 shared several components with the older vehicle. The hull's rear powertrain, which included the Continental AOS-895-3 air-cooled engine and Allison CD-500-3 crossdrive transmission, and the suspension were common to both vehicles. In August 1951, Cadillac Motor Car Division delivered the lead M42 (trial designation T141). The vehicles were assigned the Standard Nomenclature List (SNL) number G-253.

After military acceptance, M42 procurement immediately began. In April 1952, American Car and Foundry (ACF) Industries joined Cadillac in vehicle production. Through these manufacturers had the vehicle in full production at this early date, the *Duster* was not type-classified as standard or designated M42 until October 1953.

Like WWII's M19, the M42 was armed with the dual-automatic Bofors M2A1 40 mm antiaircraft cannon. The earliest production M42s had conical shaped, naval-style flash suppressors on the gun muzzles, but late production vehicles used a three-prong flash suppressor. Less noticeably, the earliest production vehicles had dual doors in the hull between the driver's and commander's hatches. These doors opened with the hatches to allow ammunition passing from the hull to the turret. The dual doors were eliminated on later vehicles. A .30 caliber gun was pintle-mounted on the side of the turret for close-in defense.

During its service life, the Duster received various upgrades such as updated communications equipment and a fuel-injected engine to replace the carburetor engine. The new engine improved the Duster's performance and range, and upgraded vehicles were designated M42A1.

When delivered throughout Vietnam, the Duster wore the Army's standard color, semigloss olive drab, paint scheme with white markings. However, by the end of its service life, the M42 was painted in the four-color Mobility Equipment Research and Development Command (MERDC) camouflage scheme.

By the time the Duster was phase out, Department of Defense (DoD) policies largely precluded operational vehicle sales, which limited the number available to collectors. These policies have since grown more strict. Today, many displayed Dusters are being retroactively and permanently immobilized by destruction of key components.

The twin 40-mm Bofors antiaircraft cannon debuted on a fully-tracked chassis in U.S. Army service with the M19 of WWII. Despite the M19's relative scarcity, the Bofors itself was one of the most widely used pieces of antiaircraft artillery with other mountings with other mountings in WWII, and the cannon was extensively used by naval forces.

January 1953—The first T141 was delivered in August 1951, the same month the Ordnance Committee officially authorized T141 development. This authorization indicated the pressures the Korean war brought and meant that paperwork did not move as quickly as the material. When this vehicle was photographed, vehicle production was well underway. (TACOM LCMS History office)

The M19's success led to further development in the post WWII era. The pinnacle of this effort was the T141. The T141 was based on the automotive components of the M41, and most notably differed visually differed from the M19 by the installation of the 40mm mount near the front of the vehicle rather than at the rear as on its predecessor. Some of the earliest vehicles featured large flat sand shields, shown here. (Patton Museum)

The T141 (redesignated M42 on 22 October 1953) carried a three-section cleaning staff on the side of the right-side ammunition box. Three padlocks secured the side stowage boxes against pilferage. The two stowage boxes on the transmission cover are characteristic of the earliest vehicles. (Rock Island Arsenal Museum)

The M42 had a conventional layout, with driver and commander in the front of the vehicle. The tracks were driven by sprockets at the rear, with a compensating idler at the front and five pairs of road wheels supporting the vehicle. (TACOM LCMS History office)

Numerous contractors, such as U.S. Royal (seen here), Firestone, and Monarch; supplied the Duster's tires throughout the years. Once in the field, a single vehicle could have assorted brands of tires. Regardless of maker, the brand was molded into the sidewall.

Shock absorbers dampened the motion of the two forward-most and rear-most road wheel positions on each side.

Like the road wheels, the stamped steel idler was fitted with 25.5 x 4.5-inch rubber tires. Ten lug nuts held each wheel in place.

The steel track shoes had rubber pads pressed into their inner surfaces. Combined with the rubber tires on the road wheels, the pads helped provide for relatively quiet operation.

To support the track as it returned to the drive sprocket, three return rollers were installed on each side. Like the road wheels, the return rollers were equipped with rubber tires.

At the center of each return roller is a hub cap retained by six screws. Two plugs in this cap provide a means of lubricating the bearings. Engine oil is the lubricant used here, as well as for the road wheel bearings. Leaks, when they occur, can be severe and must be dealt with quickly to prevent the bearing from seizing and immobilizing the vehicle.

M42 suspension was via torsion bars with arms, like this one connecting the road wheels to the ends of the bars. This system provided a smooth ride and required relatively few moving parts compared to the suspension of many WWII American armored vehicles.

The dual return rollers are supported by a heavy cast steel support bolted to the hull. The track's guide teeth run between the dual return rollers, as they do with the road wheels.

Track tension is maintained so that less than one inch of sag space exists between each return roller or between a roller and drive sprocket or idler wheel. (John Adams-Graf)

Whereas the sprockets are relatively simple parts cut from steel plate, the drive sprocket hub is a costly steel casting and is normally only replaced if damaged in combat. The holes allow rope to be attached to the hub, and the hub can then be used as a windlass to pull replacement track into place on the tank.

The tracks are driven by the drive sprocket's teeth, which engage each track link near both ends. The sprockets themselves are bolted in place onto hubs. As the teeth wear, the sprockets are removed, flipped, and reinstalled so that the driving forces are transferred to the other edge of each tooth.

Rubber shoes on the track allow the tank to operate on paved surfaces with minimal damage to the roadway and help silence the vehicle's operation. (John Adams-Graf)

The rear of the M42 clearly indicates the family "look" it shares with its sibling, the M41. While the sloping armor of the rear hull is a ballistically sound design, the massive Allison CD-500-3 transmission behind the armor has more bullet-stopping power than the armor.

The skids ran the length of the fenders and were centered above the track.

Track skids were fitted to some of the vehicles. These simple parts helped prevent damage due to track slap. The ends were tapered (shown here) so the track would not get snagged.

Beneath the stowage compartments, the fenders' undersides are relatively smooth and are supported by brackets located above.

The front- and rear-most fenders are embossed to stiffen them. These embossments are clearly visible on the underside of the fender.

Heavy-duty lifting eyes are integral with the rear armor plate. The lamp on the left includes a red service stop light lens while the lamp on the right has a blackout stop light. The small, rounded bracket between the taillight and final drive housing is a deflector, which prevents a thrown track from snagging the rear hull. These deflectors were not present on all vehicles when they were built but were retrofitted to the ones that were not factory-equipped. (John Adams-Graf)

A quick-release pintle hook was installed at the rear of the tank. This hook installation allowed the Duster to tow an ammunition trailer. (John Adams-Graf)

Near the right-hand final drive is a small door that opens into the right-hand battery box. Behind this door are the trailer electrical connections.

The Duster's upper rear armor plate was .5-inches thick, and the lower plate was .75-inches thick of rolled homogenous steel. The vehicle was 126.9-inches wide with a tread footprint of 102.5 inches.

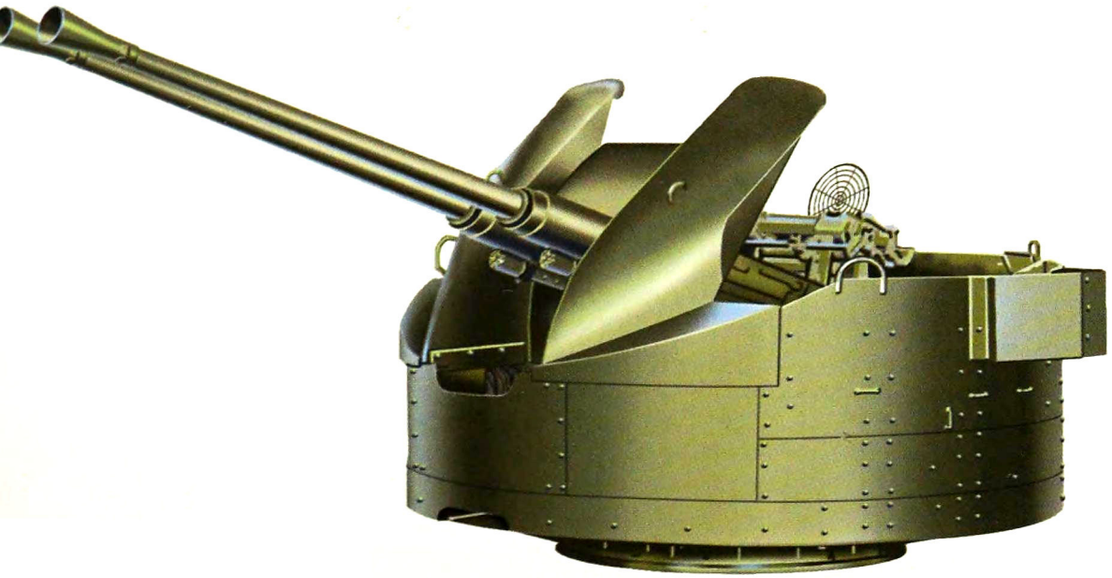
The Duster's underside, viewed front to rear, has a square opening visible on the hull centerline for the discharge of spent 40mm brass. The Duster has a 17.3-inch ground clearance.

This is the reverse side of the left front road wheel. This road wheel station is connected to the idler wheel by a compensating arm and linkage.

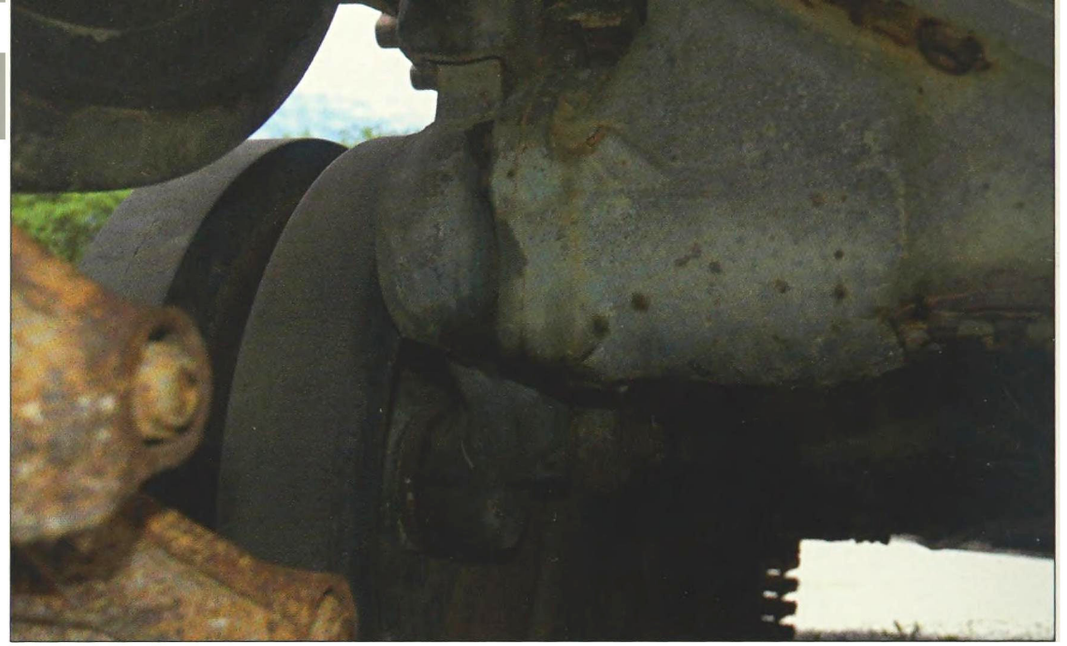
A mirror image of the same system was installed on the right side of the vehicle. The front shock absorber connected the front supporting arm to the hull, dampening sudden road wheel movements.

Gun mount

The gun mount of the M42 was very similar to that used on the earlier M19. Both featuring the M4E1 mounting.

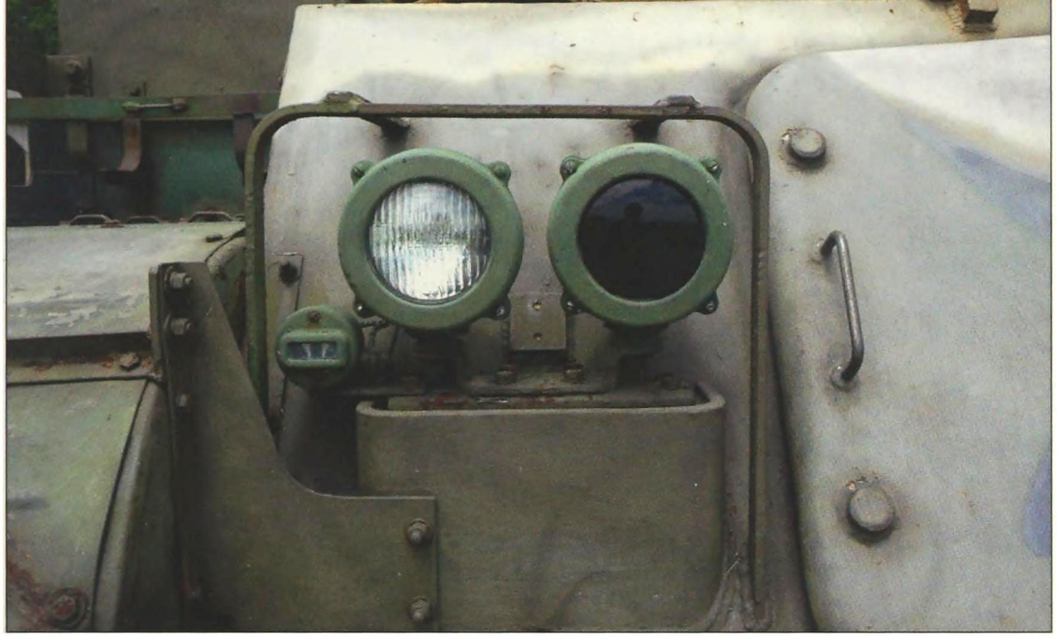


M42 ammunition storage capacity ..... 480 rounds
Sights ..... M38 computing sight,
M27 azimuth sight, M24 optical sighting ring
Gun elevation .....+89 degrees to -5 degrees manually
+87 degrees to -3 degrees hydraulically
Maximum elevation rate ..... 25 degrees per second
Turret traverse range ..... 360 degrees
Traverse rate ..... 40 degrees per second



At the point where the torsion bars penetrate the hull, they are supported and retained by heavy steel castings called arm supports. Each arm support has double duty—supporting the torsion bar's lever end connected to the road wheel nearest the casting and providing a mounting point for the torsion bar anchor that holds in place the terminating end of the torsion bar connected to the road wheel on the opposite side.

Armor thickness of the upper front of the Duster hull was .5-inches while the lower front hull plate was increased to a 1-inch thickness. Each track was 21-inches wide and was comprised of 75 6-inch pitch shoes.

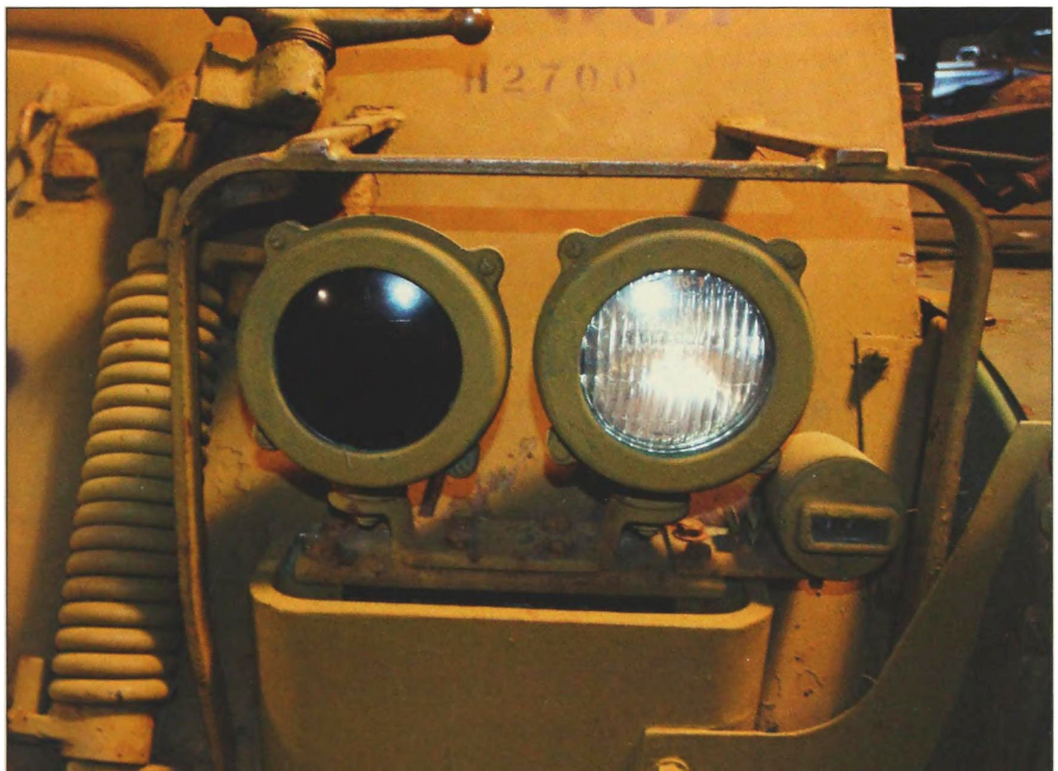


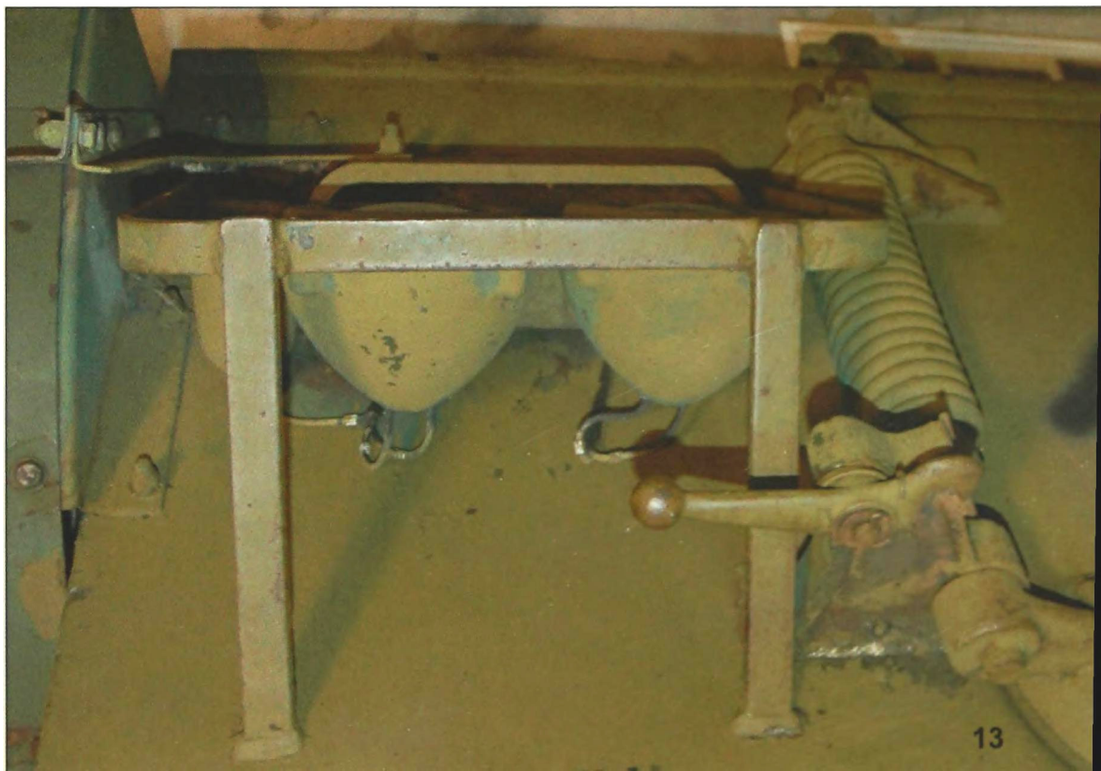
Two different headlight configurations were used on Dusters, and in some cases the arrangement differed from side to side. The earliest configuration, shown here, featured two large lamps and a single small lamp on the right-side, or commander's side, of the vehicle. One lamp is a conventional headlight, and the other is an infrared driving light. The small lamp is a blackout marker lamp.

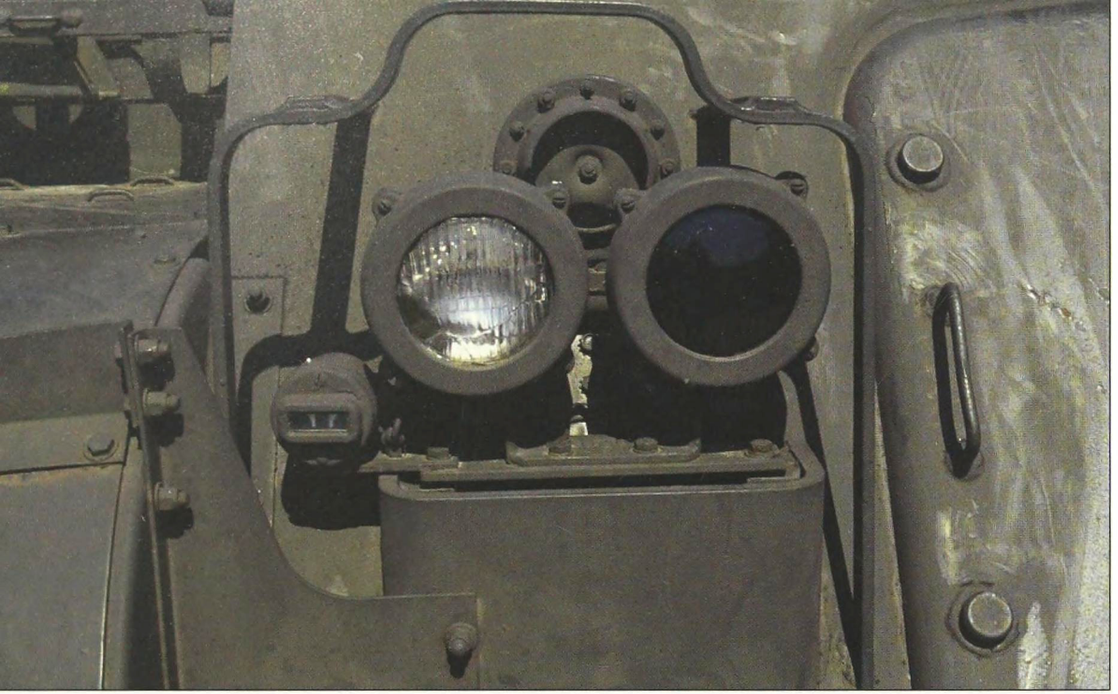
The early Duster had a driver's side headlight array that mirrored the one on the right side.

A simple fabricated guard protected the relatively fragile lamps from damage by brush and light rubble.

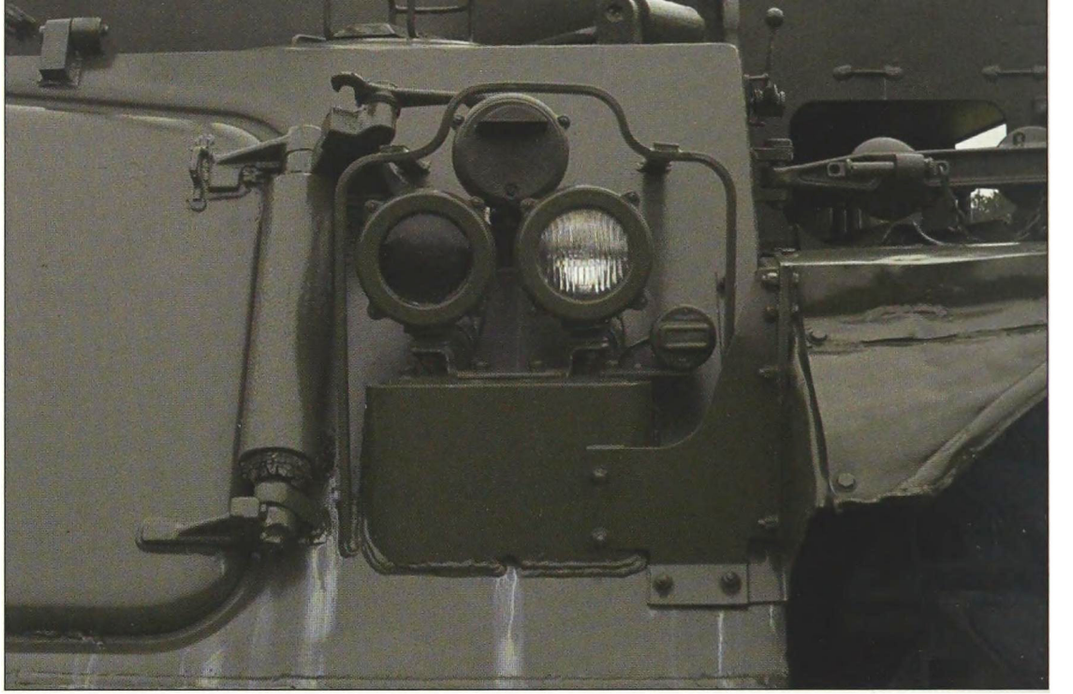
The hull door open safety latch extends above the driver's side brush guard. The insulation on the wire leads to the headlights were unpainted black when the vehicles were new (or when the lamps were replaced), but were covered in paint whenever a vehicle was repainted.





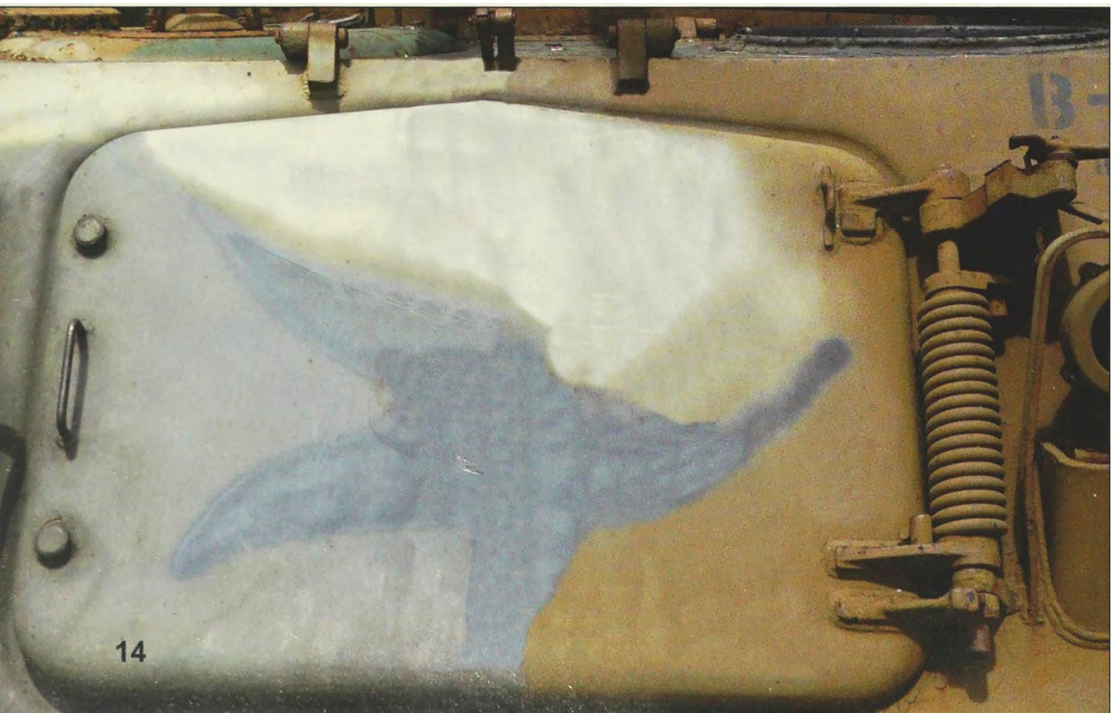


On later vehicles the brush guard was substantially larger and of a different shape that extended beyond the horn's mounting position and behind the right side lamp cluster. (John Adams-Graf)



The later style brush guard was also mounted on the driver's side, and at the top of the lamp cluste, was the tradition blackout driving light. (John Adams-Graf)

Centered on the front of the hull was a large door that made entering the Duster significantly easier to enter than most AFVs. The large spring between the hinges acts to counter the weight of the armored door, which makes opening it fairly easy.

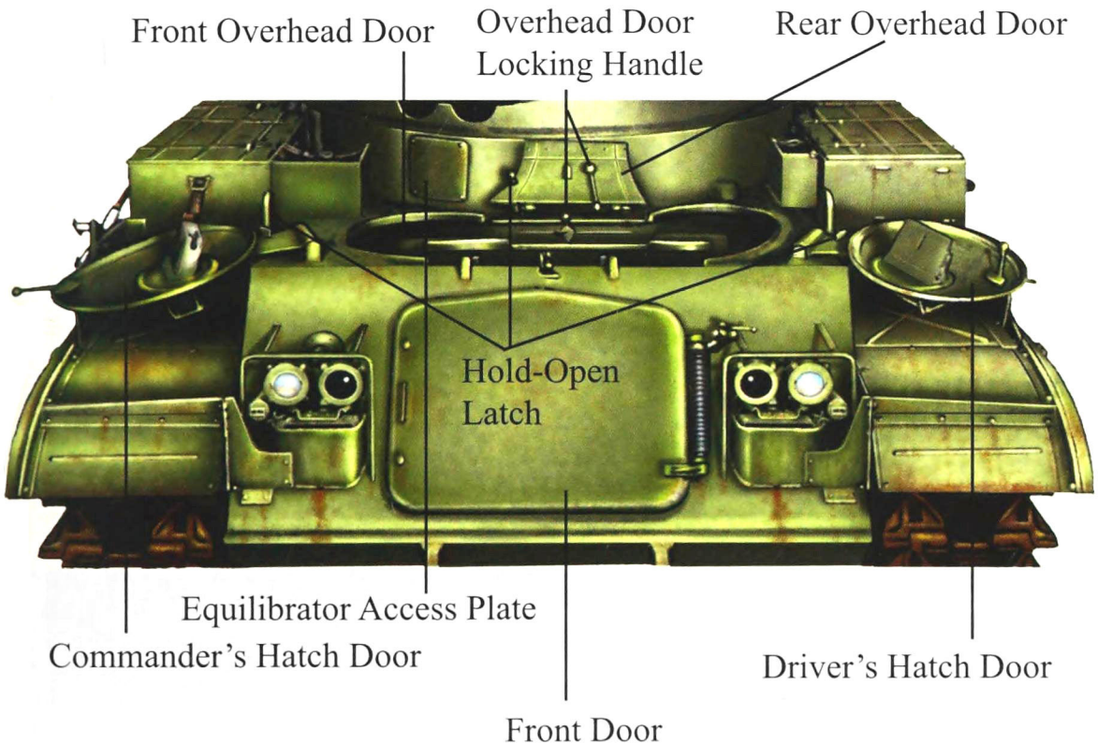


On later vehicles, the door was cluttered. The .30 caliber ammunition box was relocated to the lower left of the door with stowage clips for the traditional L-head flashlight mounted above it. Centered on the door was a stowage compartment for an M19 periscope. A smaller stowage box was in turn mounted on the periscope box. (Paul M. Hayward)

A conventional driver's hatch door was in the forward left top of the hull plate. A U-shaped section of heavy wire welded to the hatch support arm engaged a safety latch to hold the hatch open.

A guard protected the periscope from debris as well as the crew's combat boots. Two guard styles were found, and this unusual shape was the one most frequently found on the Duster.

This recreated illustration from the M42 technical manual shows the details of the early production vehicles' driving compartment overhead doors.



Late production Dusters did not have the large hatch door in the top of its hull. A plain armor panel plate filled the area. Accordingly, no hinges or latches are found in the area, a marked contrast to the somewhat cluttered appearance of this space on early vehicles.

This swing-away clamp prevented the spare barrels from sliding forward and also capped the ends of the barrels to protect them from foreign objects and debris.

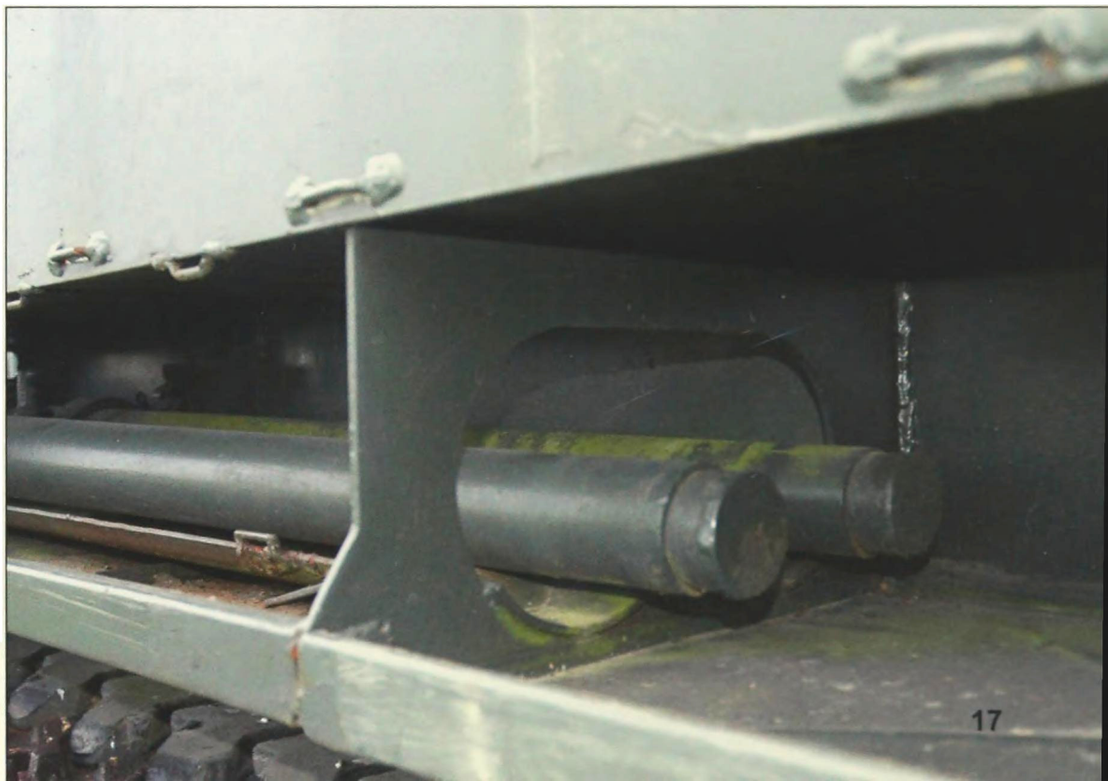
A periscope mount was installed in the driver's hatch door. The hatch door latch was a simple lever and bevel mechanism. When the U. S. Army adopted camouflage paint schemes rather than the traditional overall olive drab, the registration numbers were applied on the doors' inner surfaces, which is the case with this example.

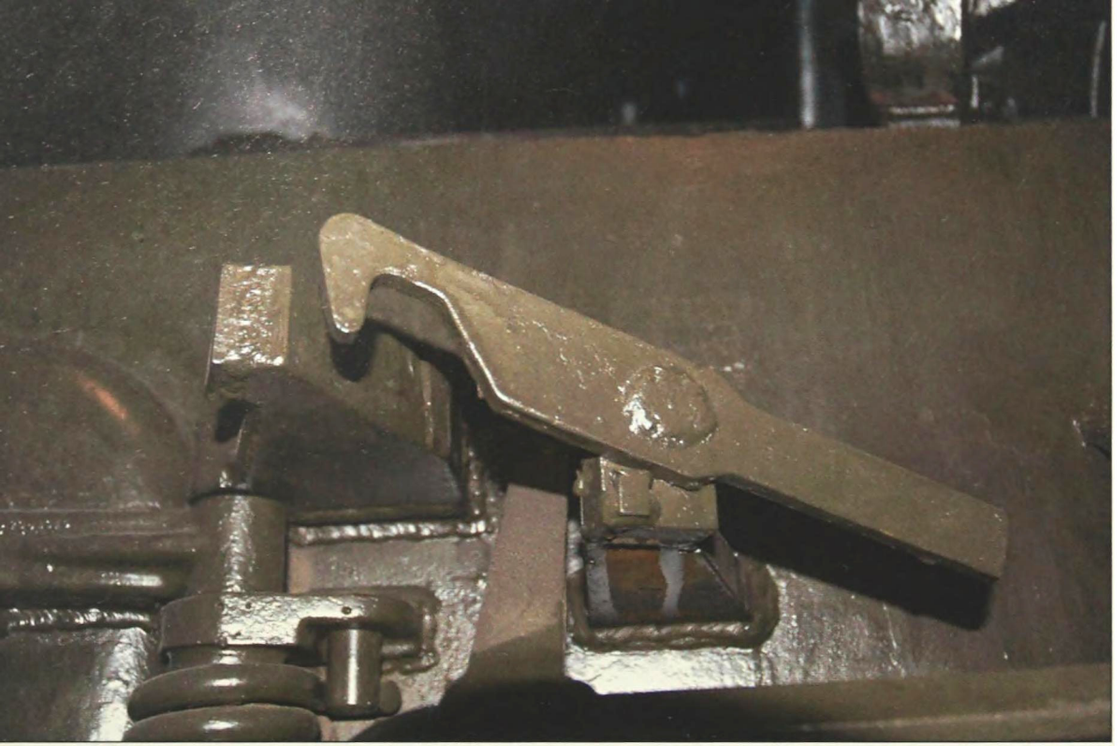
A support for the driver's hatch door when it is open is in the foreground. A rubber pad is located at the top of the support and helps prevent unnecessary wear. The lever in the background releases the safety latch that is used to hold the hatch door open. (John Adams-Graf)

Above the spare barrel stowage area were three ammunition lockers. This one is the center locker. Each padded V-shaped compartment held a clip of four Bofors rounds.

The ammo locker supports were cut out to provide clearance for the spare gun barrels. The barrels nestled into these troughs.

Plugs close the muzzle end of these spare barrels on this display vehicle.





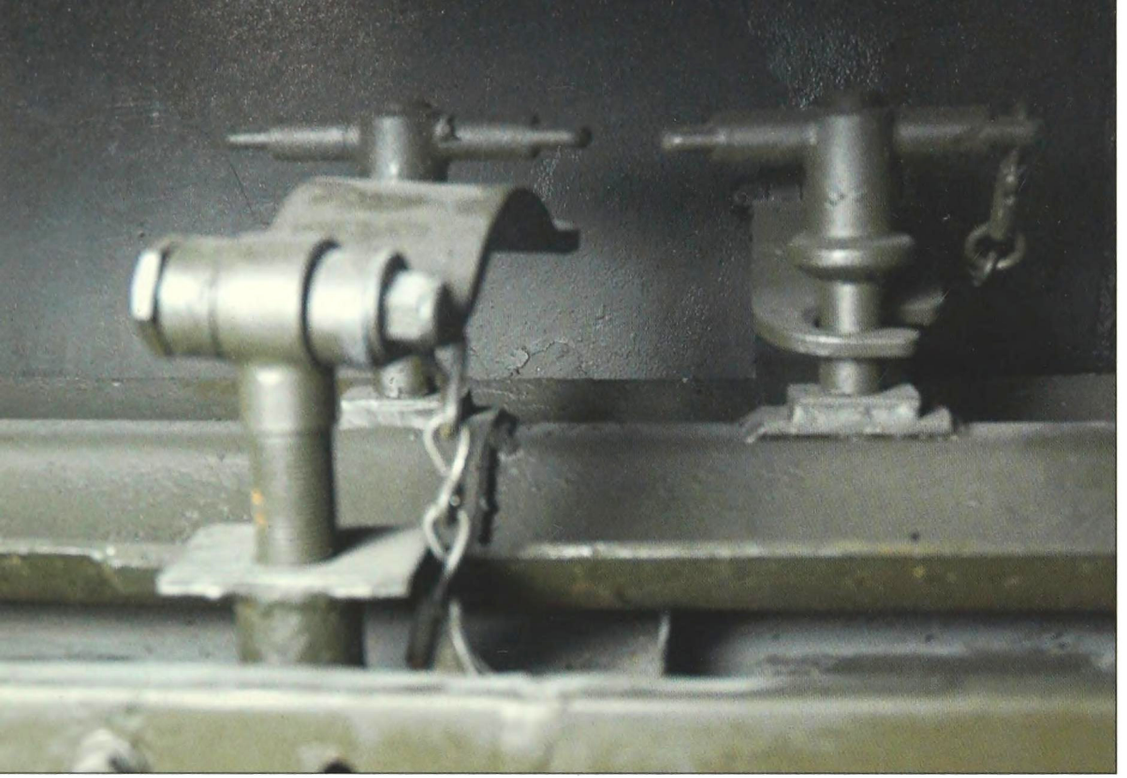
This latch was used to secure the large front door of the Duster when it was open.

Each 296-pound barrel assembly terminated with an interrupted screw thread and heavy duty recoil springs.

The tops of the ammo lockers were embossed in order to strengthen them. A tow rope bracket is in the foreground.

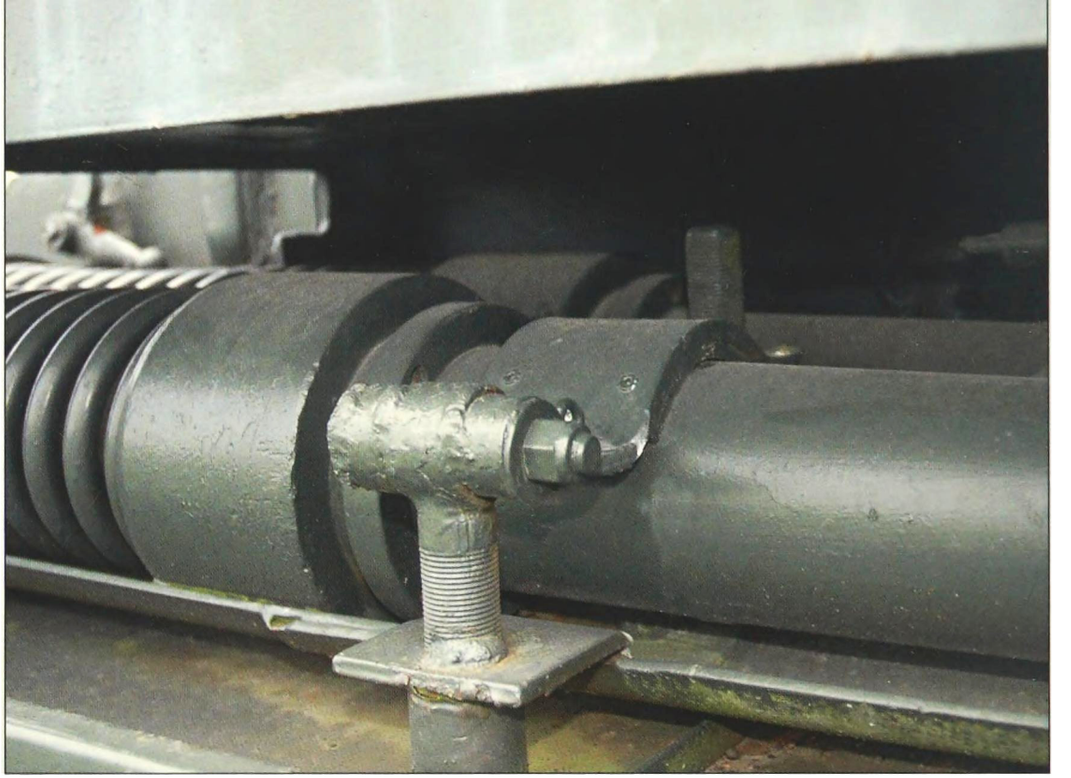
The latches closing the ammo lockers were simple but robust steel rod assemblies.

With a well-trained crew, each of the Duster's two Bofors cannons could fire 120 rounds-per-minute. Such firing rates could rapidly erode the barrels, which degraded accuracy and range. Accordingly, two spare barrels were carried on each vehicle in an open compartment above the driver's side fender.



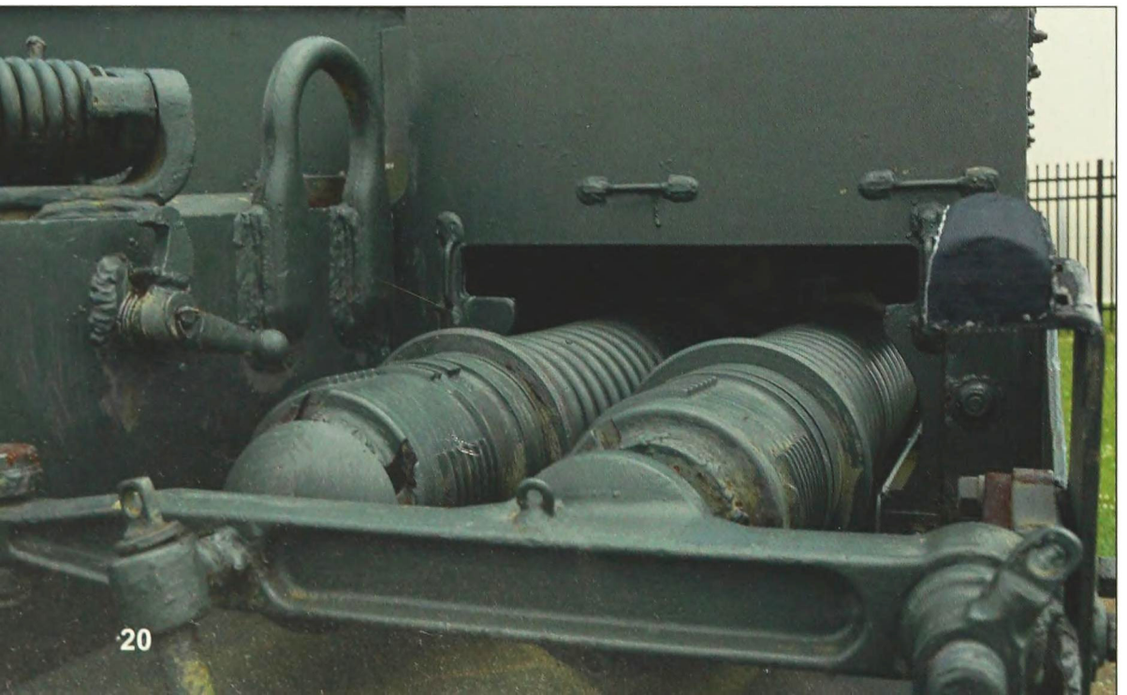
The spare barrels were expensive, heavy, and precisely made. Clamps near the front of the stowage rack held the barreks firmly in place and prevented them from sliding toward the rear of the vehicle.

The interrupted screw threads on the ends of the barrels allowed them to be changed rapidly.



Though welded firmly in place on this exhibit vehicle, these clamps could be loosened in service to permit the spare barrels to be removed.

After releasing the spin-on nut, the forward bracket swings to the front of vehicle, and releases the gun barrels.



The Duster's mufflers would get so hot during operation, they would glow. A heat shield was installed to protect personnel and to aid in concealment during night operations. After extended operations, the paint would blister off, and a layer of rust would form. The heat shield on this vehicle is freshly painted;

A stowage bracket mounted above the driver's side muffler held four spare track links.

A large oil bath air cleaner was located on each side of the Duster between the stowage compartment and the muffler.

A large sloping armored hatch at the rear of the vehicle formed one half of the cover over the transmission. Two smaller hatches flanked the rear transmission cover, each covering a pair of 6 TL 12-volt military batteries.

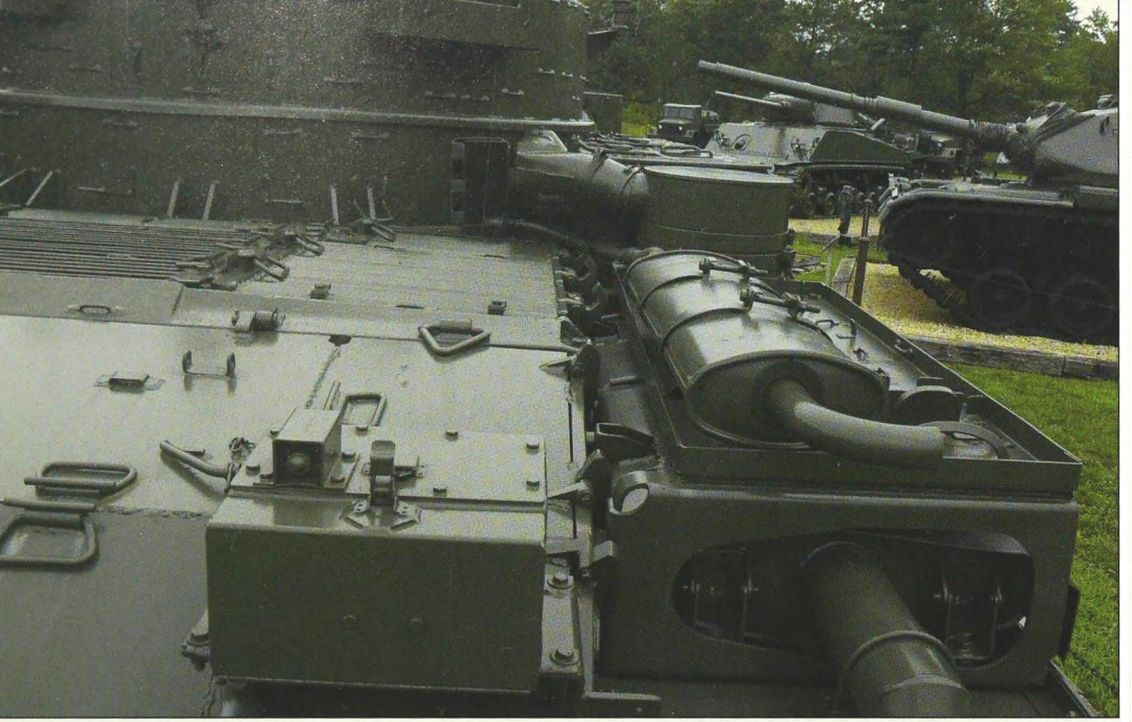
The engine was located near the center of the tank, and large heavy grilles allowed cooling air to flow to the engine and to the oil coolers on either side of it. This Duster, in the midst of a restoration, is missing its ammo box lids and a few other components. (Stuart Robinson)

Near the center of the rear transmission hatch is an armored liquid filler cap, which protects the transmission oil fill cap. The transmission used the same lubricant as the engine.

A pair of cast stops limited just how far the battery door could open and prevented damage to the exhaust system. (John Adams-Graf)

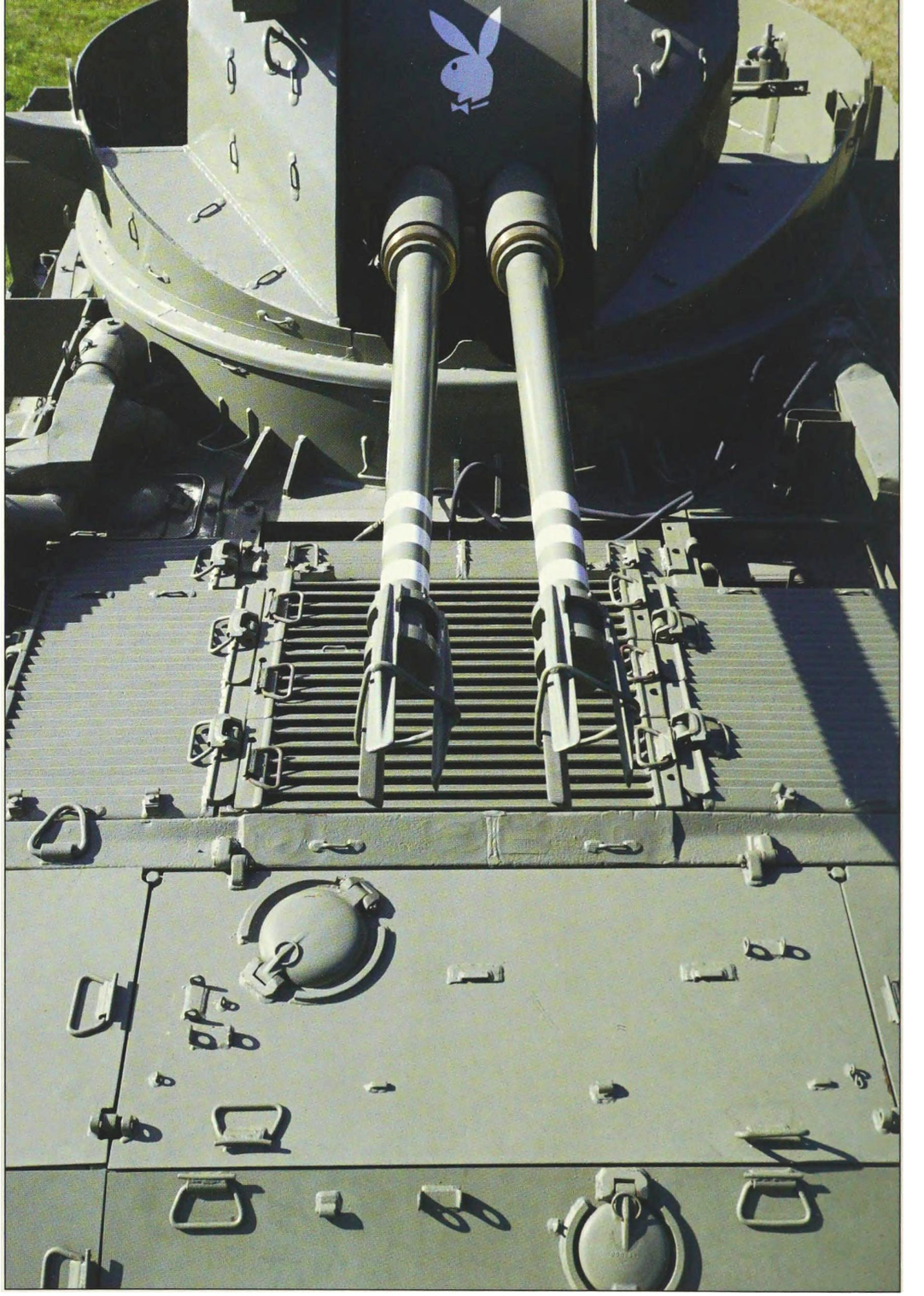
Most of the components of the rear hull were common with those of the M41 Walker Bulldog 76mm gun tank. (John Adams-Graf)

The taillights were protected by heavy steel guards welded to the rear of the hull. The robust lifting ring was adjacent to the taillight.



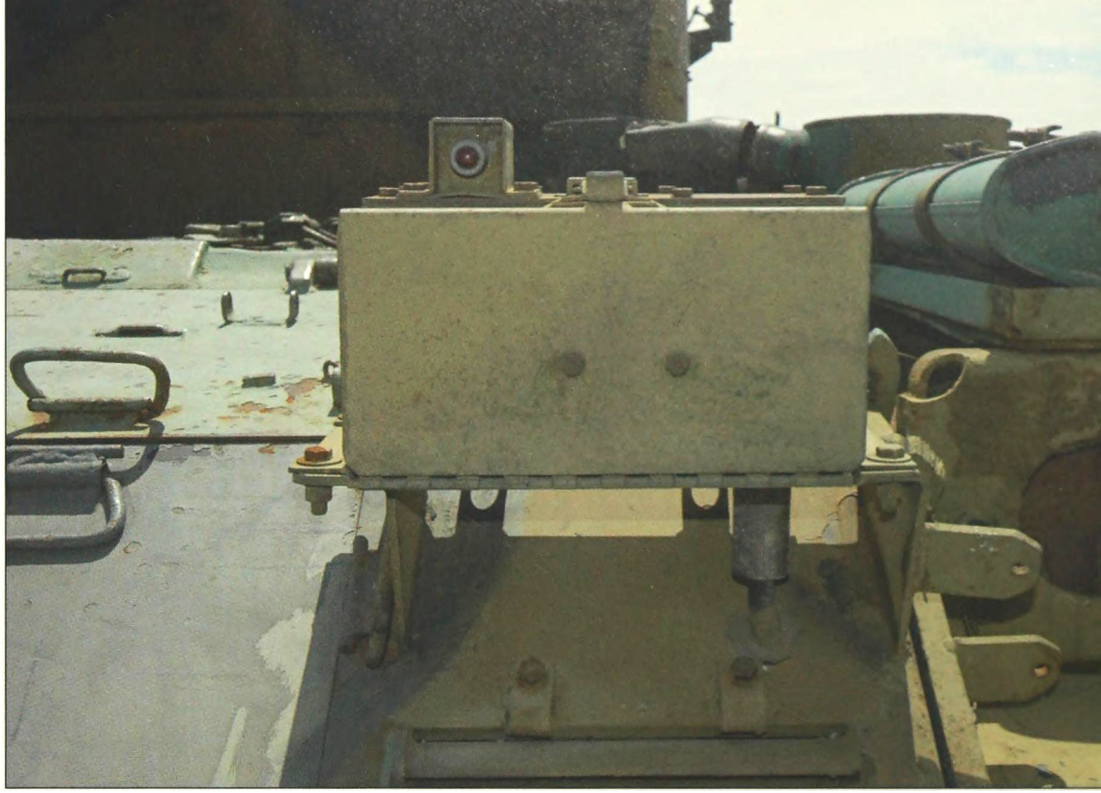
Above the right-hand muffler was a pioneer tool rack. While the auxiliary power unit (APU) initially had no muffler, this problem was quickly fixed, and m42s began leaving the factory with this small muffler mounted above the right main muffler. (John Adams-Graf)

The right rear light assembly featured a blackout stop light at the top rather than service stop light, and accordingly the upper lens appears clear.



The upper, or forward, transmission cover also had an armored filler cap. This one protected the engine crankcase oil filler. (Stuart Robinson)

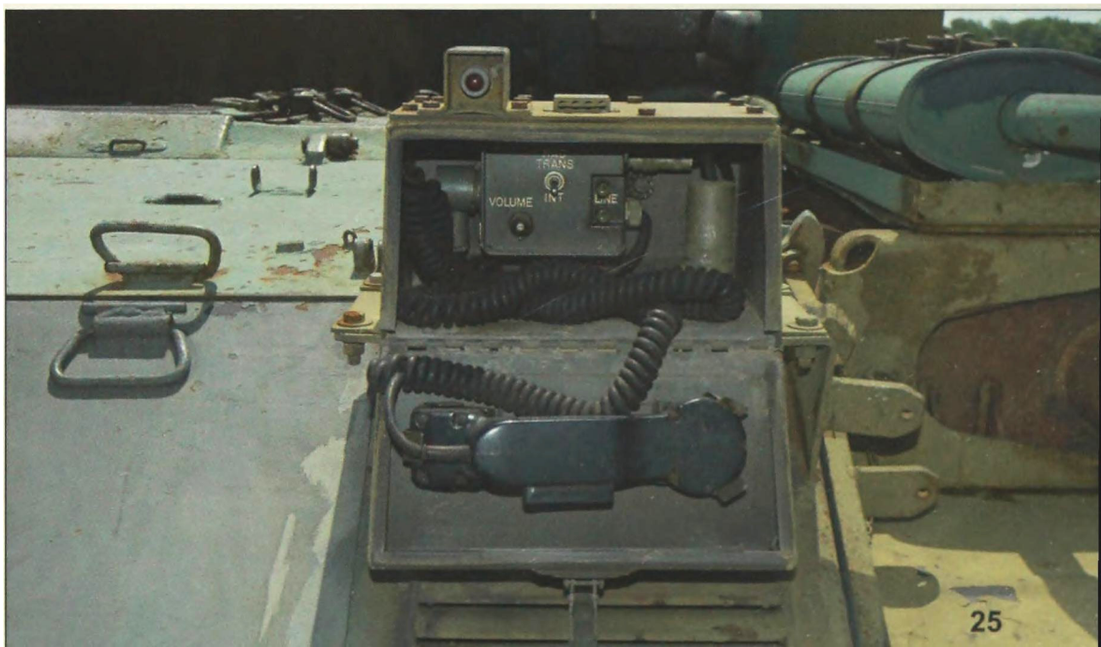
As with the left-hand muffler, a heat shield shrouded the right-hand muffler. Exhaust deflectors were mounted on the exhaust outlets.



A Modification Work Order (MWO) put weather-tight boxes on the vehicles' right rear.

Though a substantial piece, the telephone box was not armored. The lid was hinged downward so that it provided a moderate amount of weather protection even when the box was open.

This box contained a telephone to allow troops on the ground to easily communicate with the Duster crew. The box also housed jacks that allowed the Duster to connect by telephone to other vehicles, the command post, or fire control personnel. This feature proved useful when the Duster was employed for perimeter defense in Vietnam.



Two large ducts connect the external oil bath air cleaners to the vehicle. The bulk of the duct was made of steel, but at each end of the duct, short sections of heavy rubber tubing were used.

The fuel filler's armored cover is beneath the air cleaner ducts on the left side of the vehicle. The ducts had to be removed in order to open the oil cooler access hatches.

The bracket above the left-hand muffler held spare track links; the bracket above the right-hand muffler (mounted backwards in this photo) held a mattock, ax, and shovel.

The open access cover reveals the Allison CD-500-3 crossdrive transmission and its linkages. Visible are the high range selector linkage (foreground) and the steer control rod (background).

The APU was housed beneath the forward-most grille on the right-hand side. The APU supplied power to operate the communication equipment and other accessories without requiring the running of the loud, expensive, and fuel-guzzling main engine. The APU could also be used to recharge the vehicle batteries if needed.

Band clamps were used to secure the APU's muffler to the pioneer tool rack. A section of flexible metal exhaust tubing connected the muffler to the single-cylinder APU engine. (John Adams-Graf)

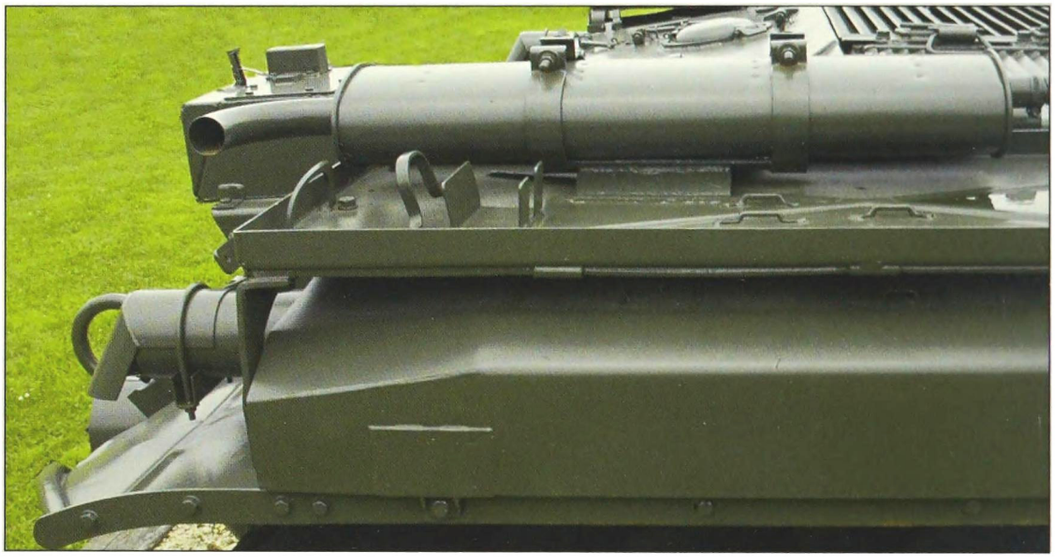
The large white object is the right-hand fuel tank; adjacent to it is the right-hand oil cooler. Although normally fueled in conjunction with the left-hand fuel tank through the armored filler, the right-hand fuel tank had its own fill tube that was accessible by opening the armored grille. This tube, along with a selector valve, allowed independent operation of the fuel tanks if needed.

This robust metal guard protected the APU exhaust outlet from debris, foreign objects, and the introduction of enemy munitions.

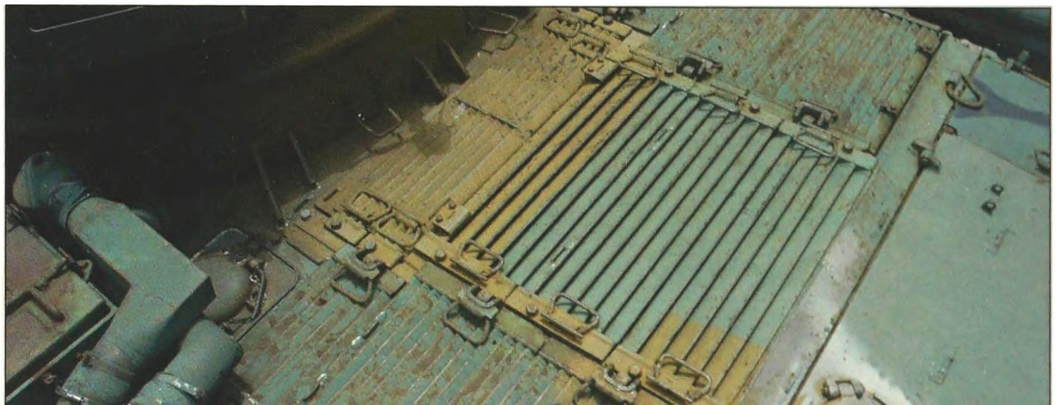
The Duster's oil bath air cleaner provided clean air for the engine. Roughly, the lower third of the filter housing was quickly removable by releasing latches. This portion, called the oil cup, was filled with fresh crankcase oil, which moistened the metal filter element and trapped dirt in place. In dusty conditions, such as in Vietnam, these filters had to be serviced daily.

Turning the main exhaust deflectors upward prevented paint discoloration on the rear fenders. The ends of the fenders were rolled for additional strength.

The M42 used the same main and APU mufflers as the M41 76mm gun tank; however, the M41 did not include the heat shields found on the Duster. (John Adams-Graf)



The outer louvered doors are hinged for easy opening, but the central grilles directly over the engine are bolted firmly in place.



This Duster is painted in the four-color Mobility Equipment Research and Development Command (MERDC) paint scheme that was introduced in 1973. While the black swathes are constant, the other three colors varied depending on the geography of the area where the vehicle was assigned. Recommendations were even made that the colors be changed seasonally.

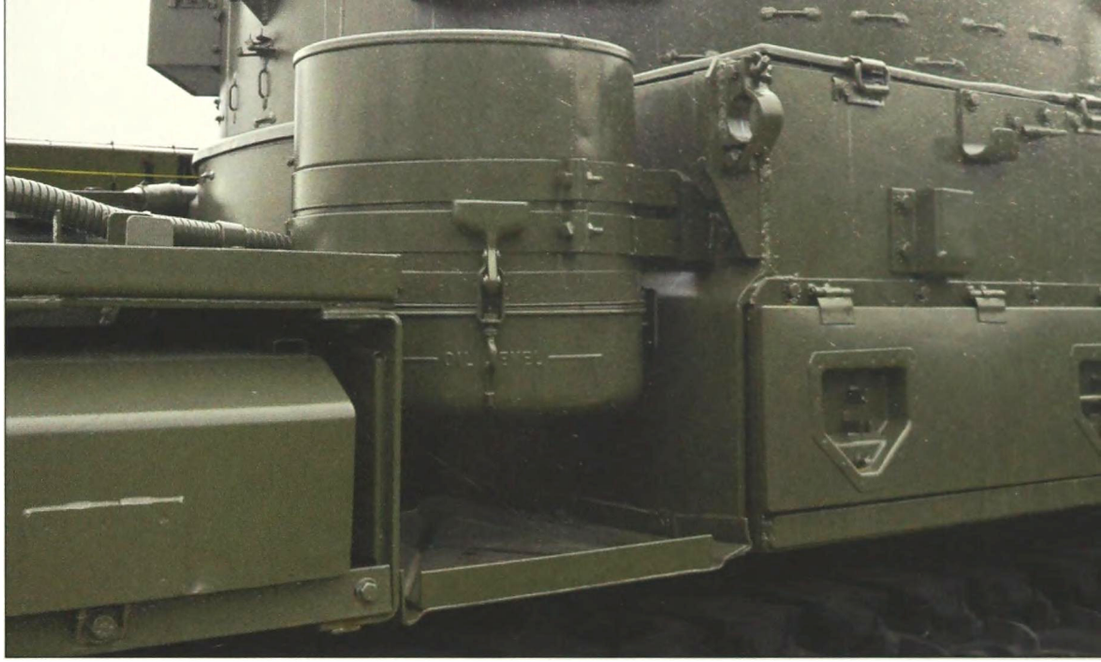
Two clamps adjacent to the air cleaner were used to secure the wire tow rope to the right-side of the vehicle.

A stowage compartment was beneath the clamps and was designed to hold the boresight and other maintenance items.

A series of stamped-steel hoops were used to support the length of the towing cable.

These clamps were held shut with wing nuts, which allowed quick access to the cable if necessary.

The condition of the rope on this monument vehicle would not have been acceptable in service. These wire ropes were kept well lubricated to prevent rust and breaking, and they were not painted because of concerns about obscuring potentially lethal defects.



Some vehicles had only one clamp for the tow cable. Also visible in this view is the "Oil Level" embossment in the filter cup. (John Adams-Graf)

The central stowage compartment housed the 40 mm Bofors cannon's spare parts and tools.

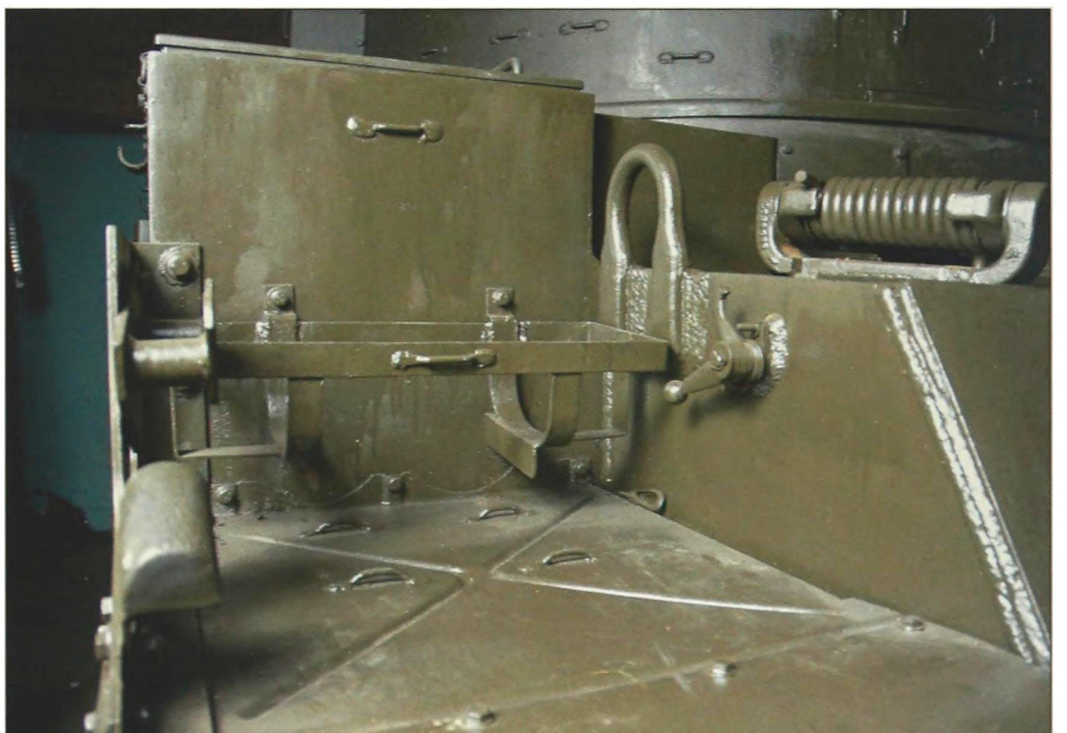
The forward stowage compartment held spare machine gun barrels, a grease gun, funnel, and other assorted bits of support material.

Simple T-handle rotating latches closed the stowage compartments. Provision was made to use padlocks to secure the compartments.

Padding protected the rounds from shock, and the lockers were designed to open quickly, with the lids falling well clear of the gun mount rotation.

Above the stowage compartments were ammunition lockers. This one is the front ammo locker, designed to hold ten clips, each of four rounds, of ammunition.

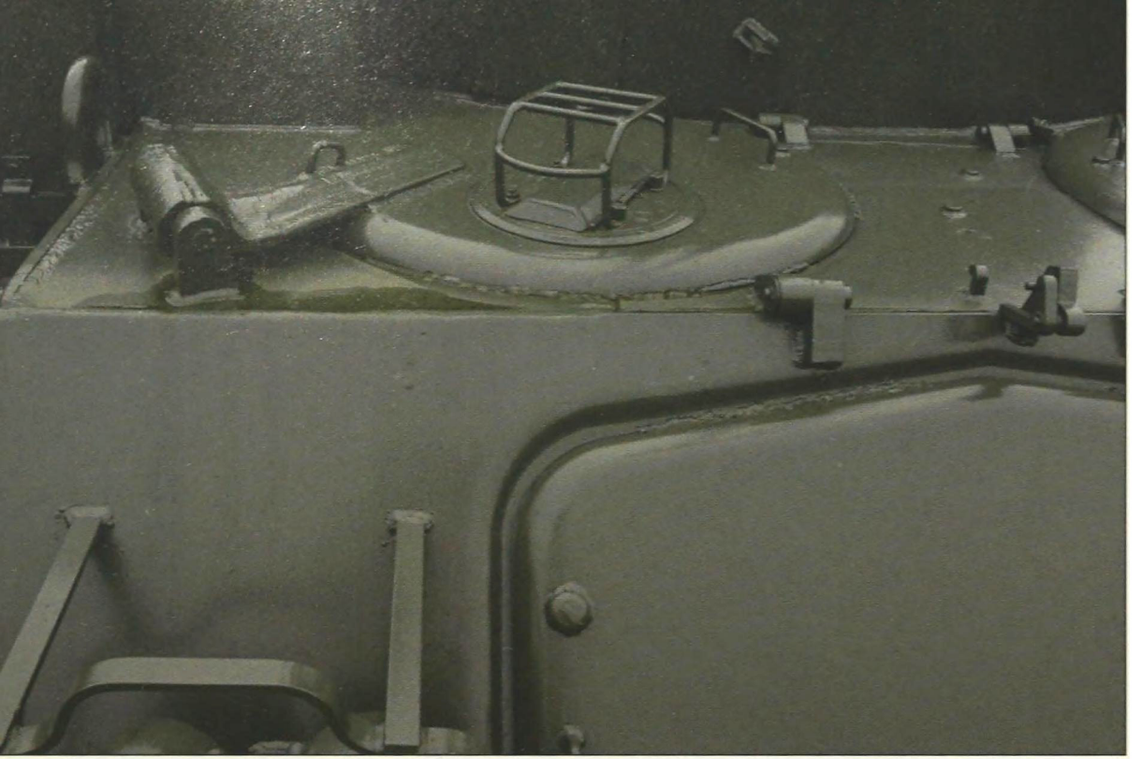
At the front of the stowage compartments was a metal "basket" that was designed to hold a five-gallon container.



Normally, a liquid container would be stowed here with the container lid up and outboard. Most frequently the five-gallon can stowed here was a water, not gasoline, can. This water stowage was probably due to the proximity to the commander's hatch.

This compartment held metal boxes of machine gun ammunition, which were .30 caliber at first and 7.62 mm in later years.

The commander's hatch door was on the right front of the upper hull plate. This particular hatch has a simple guard for the periscope.



This guard style is commonly found on driver's hatches but is on the commander's hatch here. This simple guard is found on the commander's hatch in many photos of preserved and operational vehicles, with the more complex guard on the driver's hatch.

This handle, just behind the driver's hatch, is normally painted red. Pulling this handle cuts the safety wire, just visible in this photo, and discharges the fire extinguishers.

The forward hatch was held open by this latch, which was attached to the junction of the glacis plate and hull top.

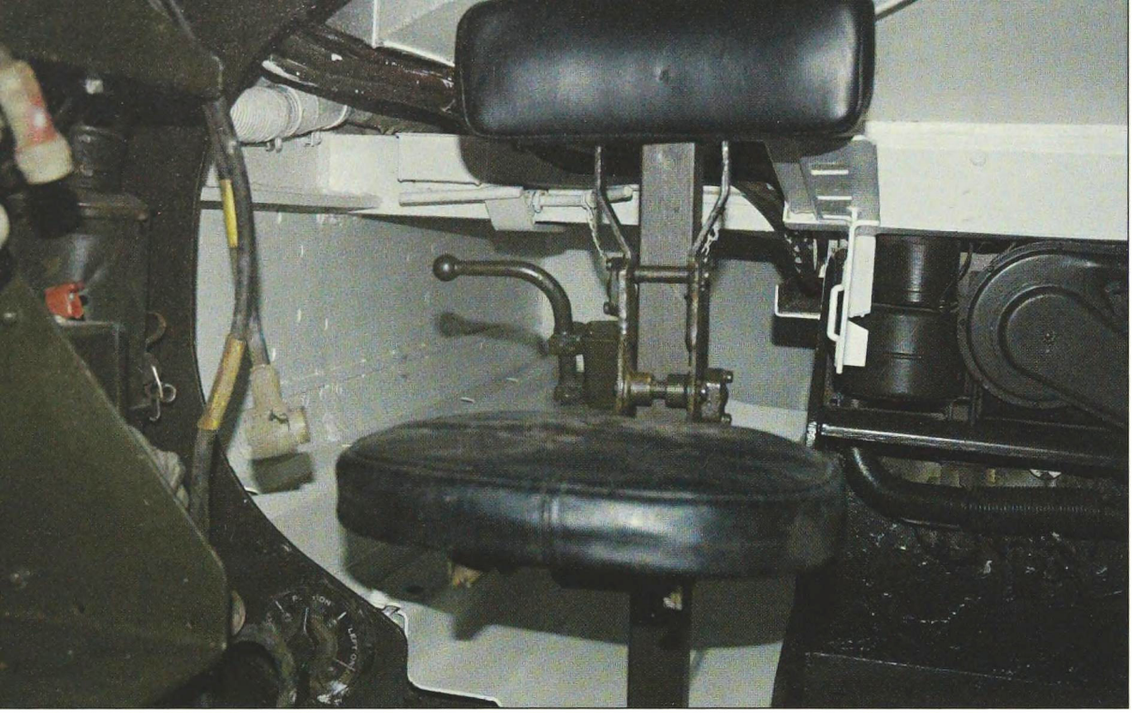
Early vehicles, with the driving compartment overhead doors, used this spring-loaded latch to secure the rear half of the hatch door in the open position. The latch was welded to the base of the gun mount.

The center hatch was not fitted to all Dusters, and even when it was in place, it was rarely used. Hence, with repeated painting the joint between the hatches gradually disappeared.

A large coil spring assisted the opening and closing of the driver's hatch door. A mirror image of this system was used on the commander's hatch door.

With the commander's hatch door open, the seat back and head cushions are visible, as is the interphone box.

The commander's basic small seat bottom is visible when looking straight down into the commander's hatch door. Normally, the top of the radio set is visible to the left, but this vehicle is undergoing restoration, and the radio system has been removed temporarily.



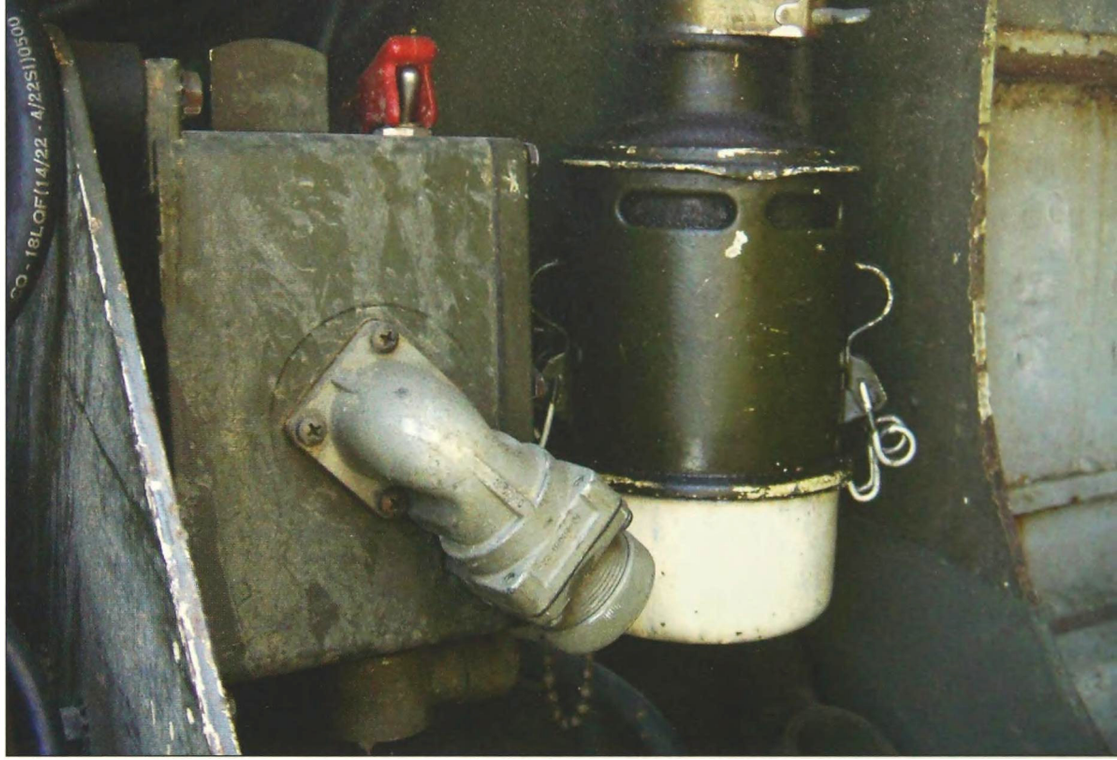
Viewed through the front door of the Duster, the adjustable commander's seat is visible. A release at the top of the seat allowed it to pivot forward, which permitted access to the ammo locker behind it. Six boxes of 40mm rounds could be stored here, and an equal number could be stored in a similar compartment on the driver's side.

Relatively early in the service life of the Duster, the interior of the driver's compartment began to be painted in the same scheme as the exterior. This painting was largely due to the amount of the interior visible when the large door in the front of the vehicle was opened. Further back, the interior was painted white.

The height of the seat cushion was adjustable. The seat cushion also would swing up perpendicular to the vehicle floor.

The commander used this lever to adjust the seat cushion height. The various colors it was painted through the years is clearly visible due to the worn paint.

These shelves and brackets held the Duster's radio installation. Initially, the vehicles were fitted with the AN/VRC-7 through 10 series along with the AN/GRR-5. These series were later replaced by the AN/VIC-1 and AN/VIC-89 outfit.



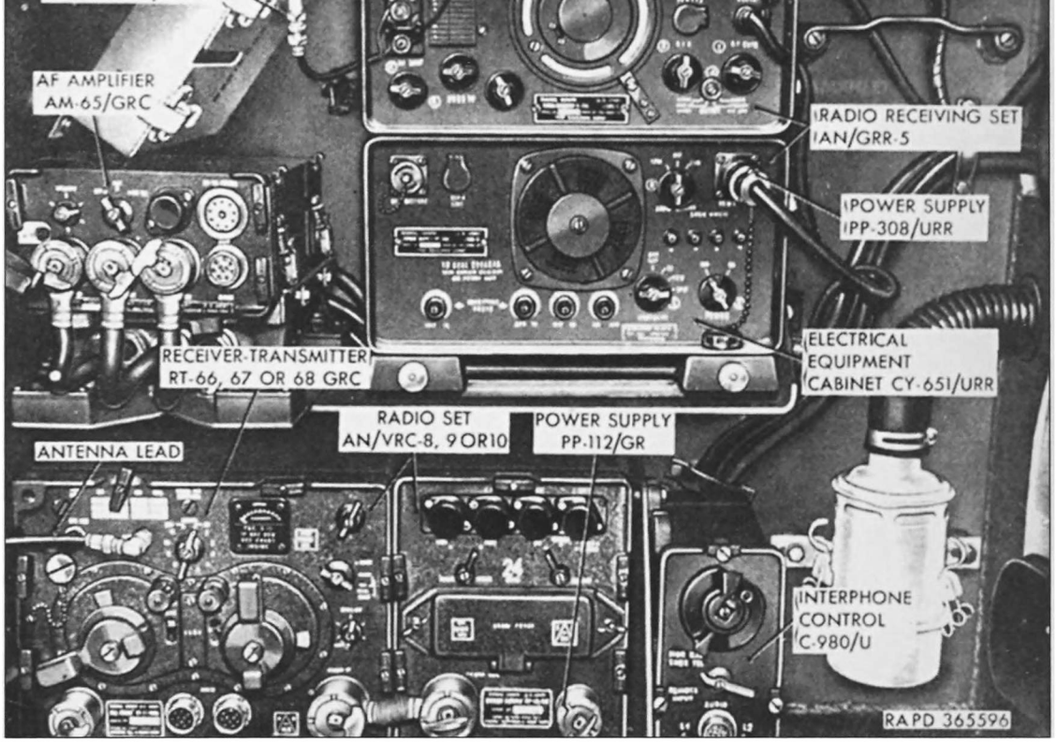
Like the main engine, air flowing to the APU was filtered by an oil bath air cleaner. However, the APU air cleaner was mounted inside the crew compartment, to the right of and just behind the commander's seat.

Behind and to the right of the driver's seat, near the floor, was the fuel tank selector valve.

Bofors ammunition sans clips were supplied in large metal chests, which could be stowed in the hull.

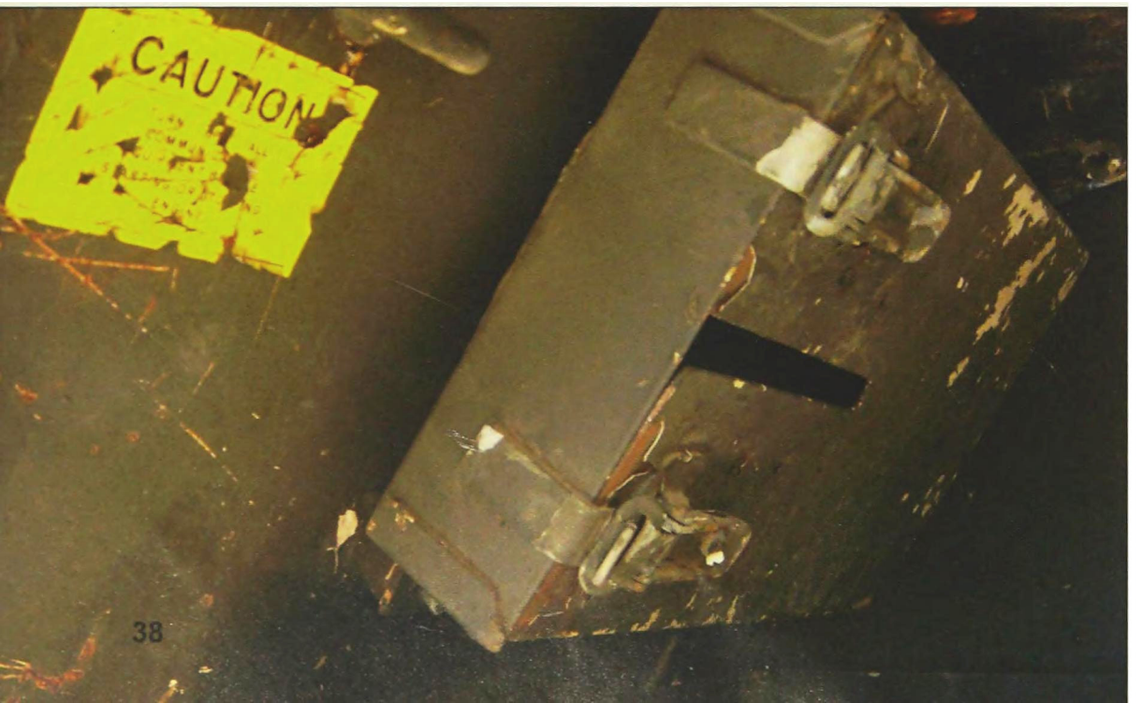
Forward and to the right of the commander was an Amplifier, Audio Frequency, AM-1780/VRC. This audio amp was widely used in armored vehicles during Vietnam and later.

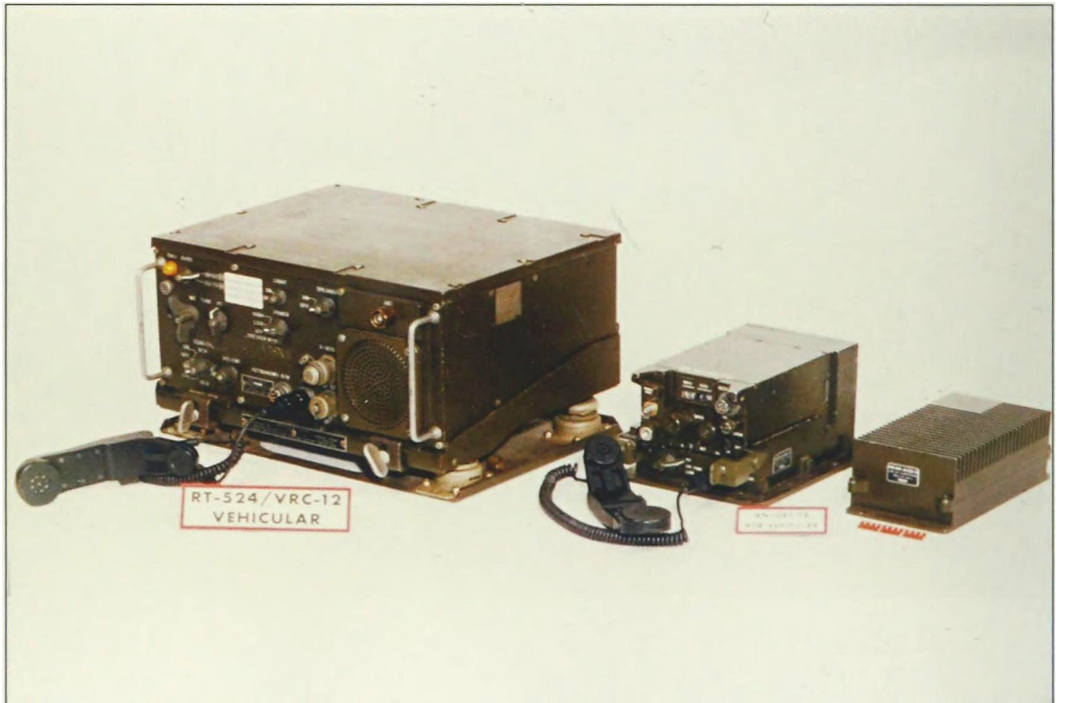
Periscope heads were among the most fragile components of an armored fighting vehicle. Thus, numerous spare heads were carried. This box, located on the inside of the glacis near the commander, carried spare periscope heads.



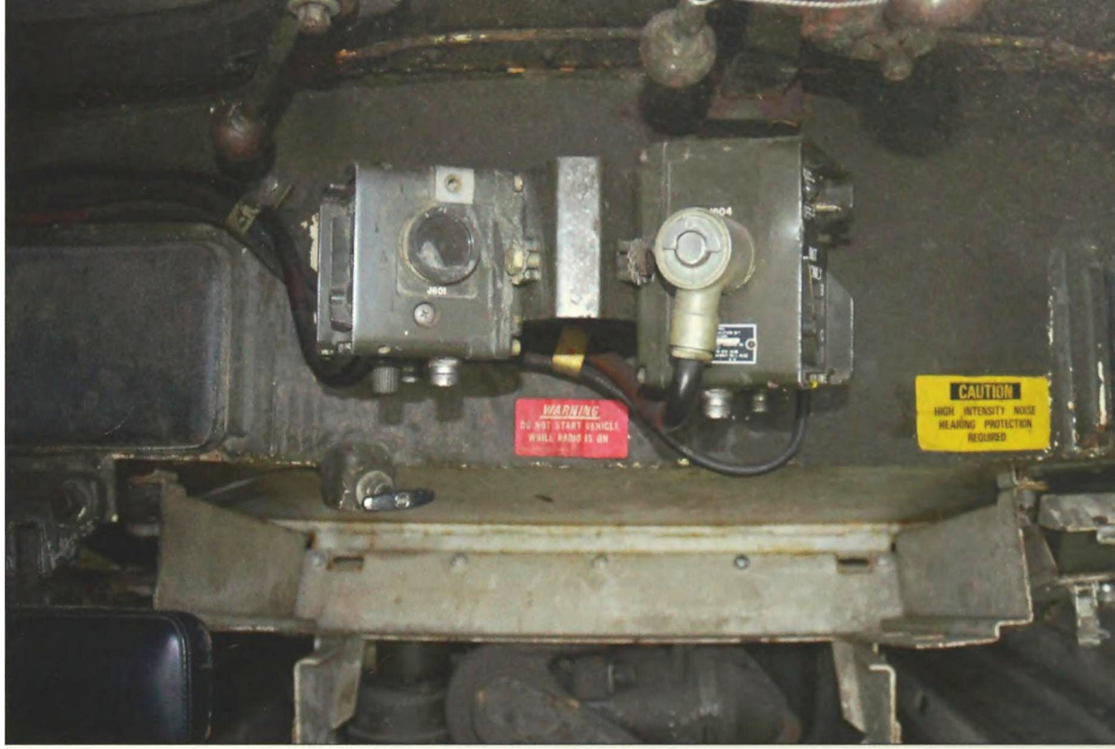
The standard radio system as installed in new Dusters is illustrated in this technical manual image. Three varieties of sets were used—the AN/VRC-8, the AN/VRC-9, or the AN/VRC-10. The type of set installed was dependent on whether the vehicle would be assigned to Armored (AN/VRC-8), Artillery (AN/VRC-9), or Infantry forces (AN/VRC-10).

The RT-524 was found in the Duster and many other vehicles in Vietnam.



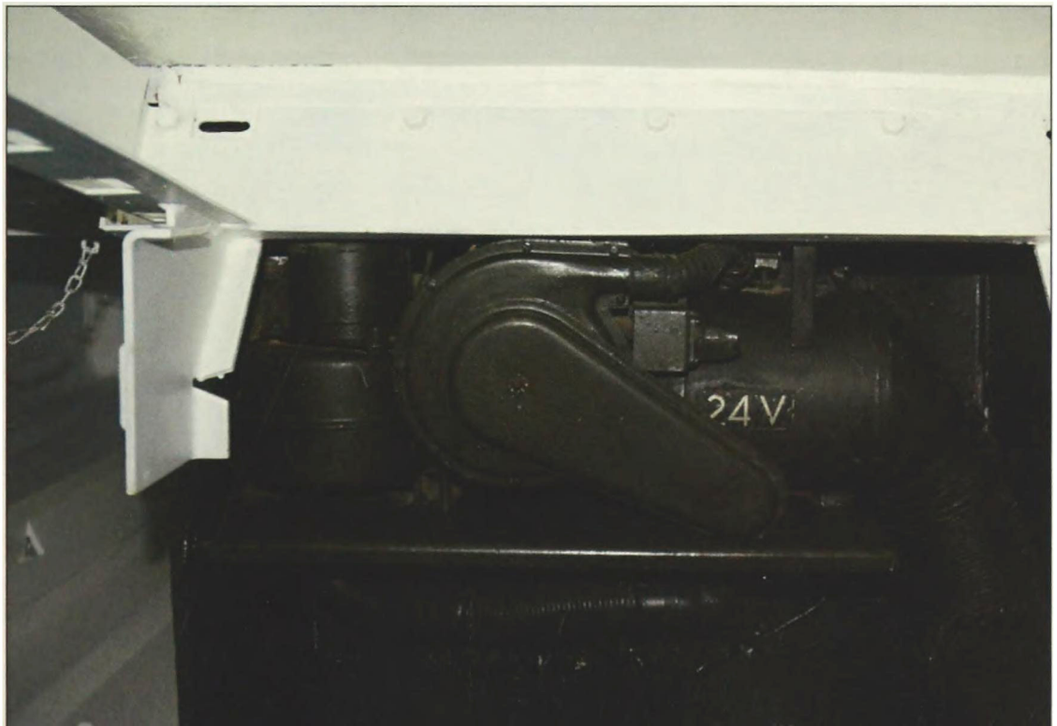


These latches secured the center hatch doors in the closed position by engaging a removable center support bar.

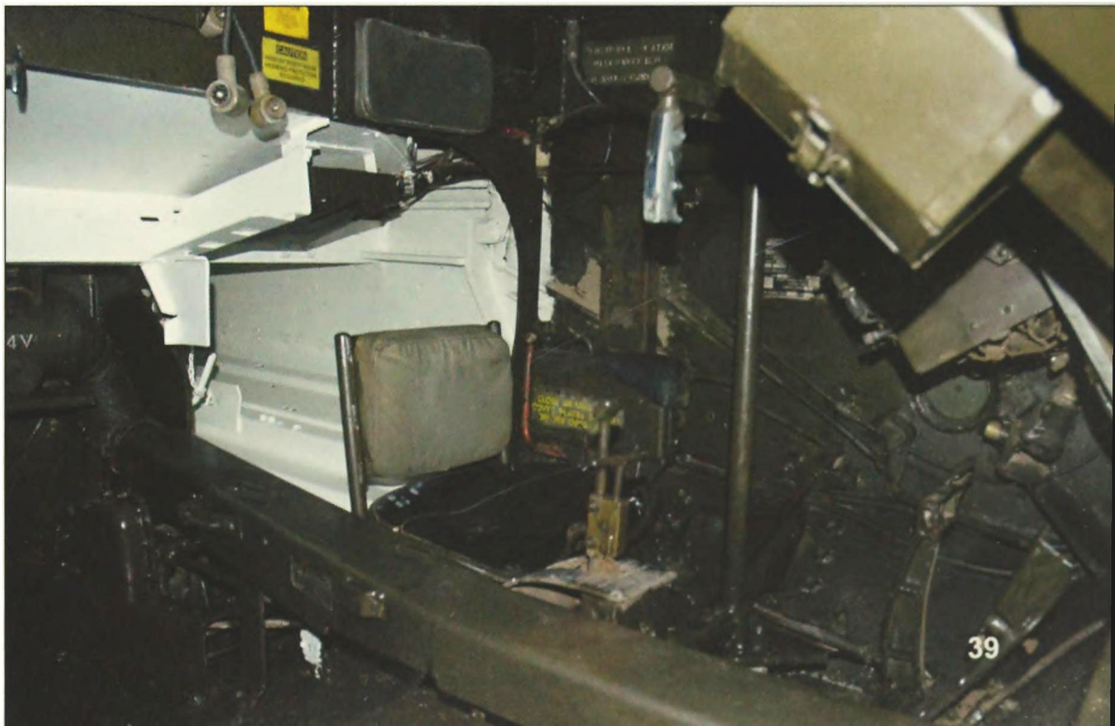


Interphone control boxes were mounted between the driver and vehicle commander. Below the commander's interphone box was the choke control for the APU.

A gasoline-fired heater, centered between the driver and commander, provided heat for the crew, at least crew members inside the hull.



The driver's position was considerably more crowded than that of the commander. Directly in front of the seat was a T-shaped steering control handle.

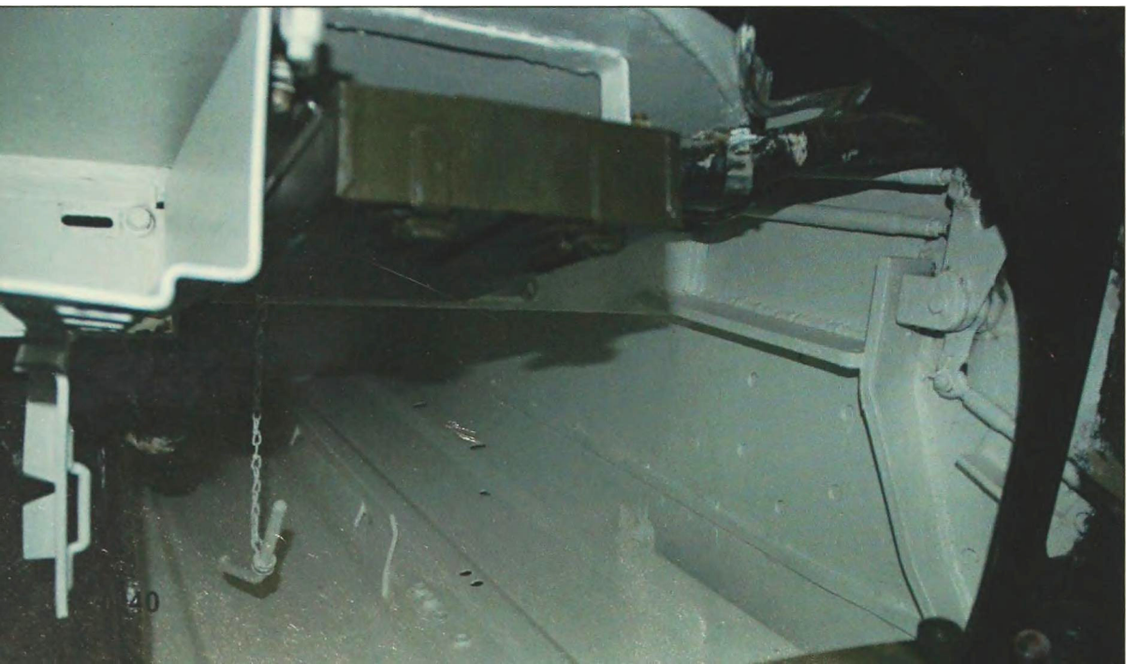


Two small instrument panels were in front of the driver. The larger one in this photo was centered just ahead of the steering T-handle. At top right is the ignition switch; at top left is the three-lever light switch. Below them are the fuel level gauges and oil pressure gauge. The small, yellow panel holds the fuel pump switch and indicator light.

Behind the removable driver's seat back was a compartment for boxed 40 mm ammo.

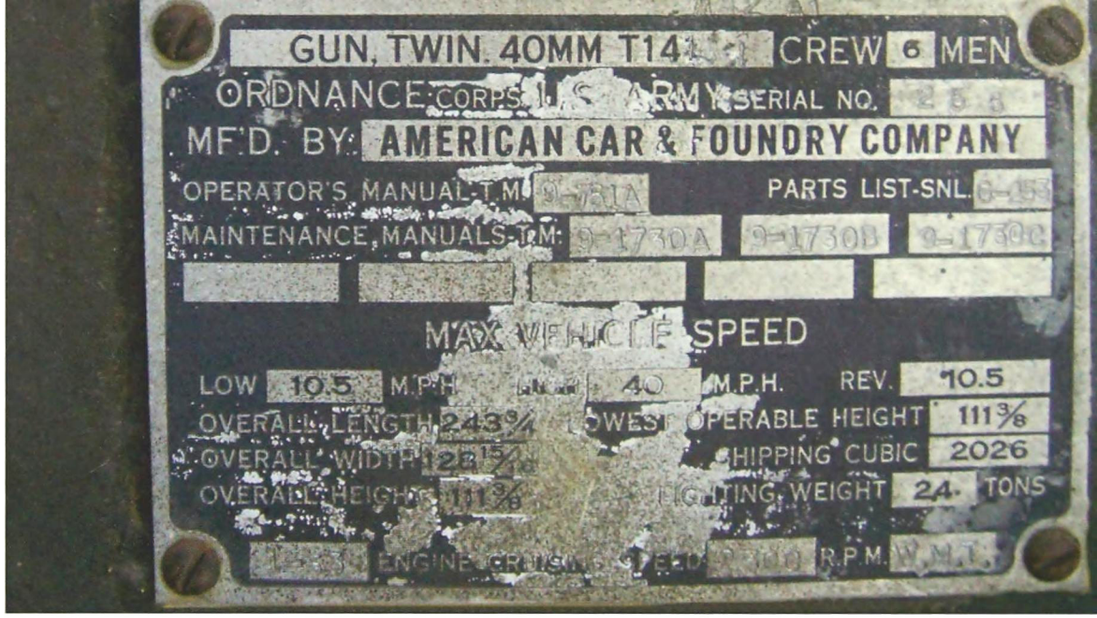
A stowage compartment, behind the driver and above the compartment for boxed 40mm ammo, held a spare periscope head.

The driver's seat height was adjustable, and it slid up and down on this track, which was attached to the left hull wall. A padded arm rest was provided on the left side of the seat.



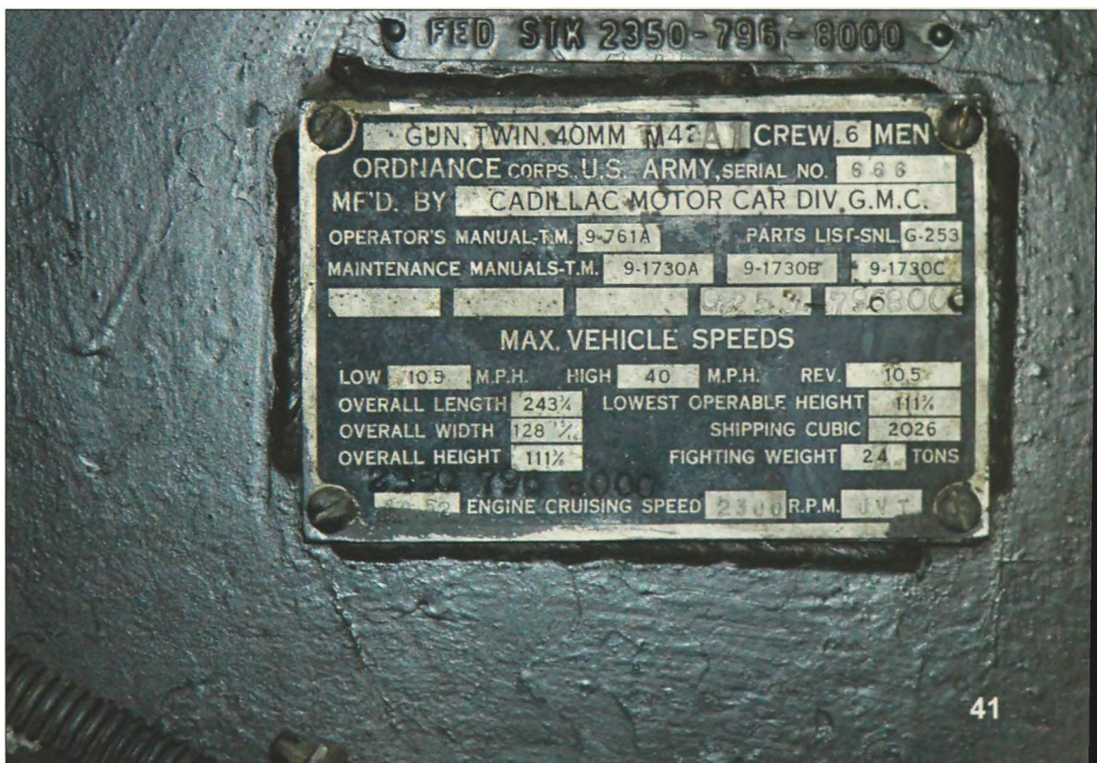
A pad was attached to the bulkhead behind the driver's head and above the seat back rest. The red handle is the interior pull for the fire extinguisher system.

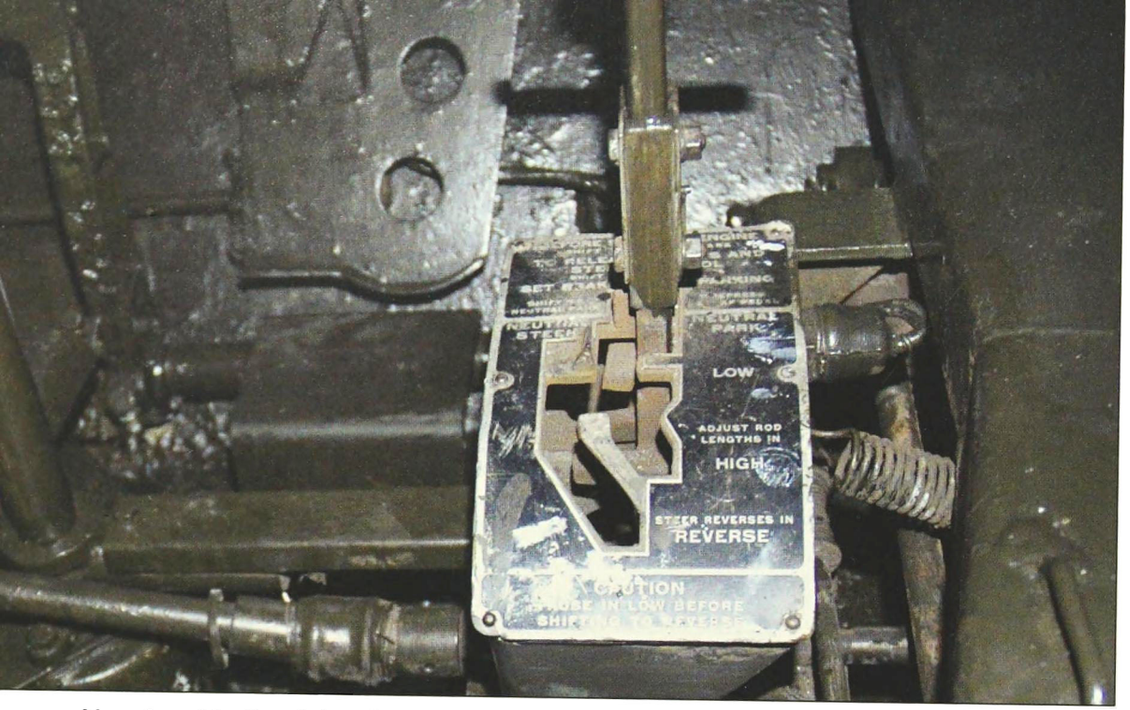
Just visible in the photo's upper left is the operating knob for the manual fuel primer pump. This pump was located in this position for vehicles 1 through 1,662 and was then relocated next to the range selector control lever. The handle extending forward of the seat adjusts its height, and the handle behind the seat drops the lower cushion to a position parallel with the hull wall.



The earliest Dusters were T141 vehicles. This unit was built by the American Car & Foundry Company. The data plate, attached to the inside hull wall to the left of the driver, provided manufacturer information, dimensional data, and a list of applicable manuals.

Later vehicles were delivered as M42s, but both the M42 and M42A1 were later upgraded to M42A1 status with the installation of a fuel-injected engine rather than the carbureted engines, which were the original engines. This M42 data plate shows the vhicle was built by the Cadillac Motor Car Division of the General Motors Corporation.


FED STK 2350-796-8000
GUN, TWIN, 40MM M42A1
CREW 6 MEN
ORDNANCE CORPS, U.S. ARMY, SERIAL NO. 666
MF'D. BY CADILLAC MOTOR CAR DIV. G.M.C.
OPERATOR'S MANUAL-T.M. 9-761A
PARTS LIST-SNL G-253
MAINTENANCE MANUALS-T.M. 9-1730A 9-1730B 9-1730C
MAX. VEHICLE SPEEDS
LOW 10.5 M.P.H. HIGH 40 M.P.H. REV. 10.5
OVERALL LENGTH 243¾
OVERALL WIDTH 128
OVERALL HEIGHT 111¾
LOWEST OPERABLE HEIGHT 111¾
SHIPPING CUBIC 2026
FIGHTING WEIGHT 24 TONS
ENGINE CRUISING SPEED 2300 R.P.M.

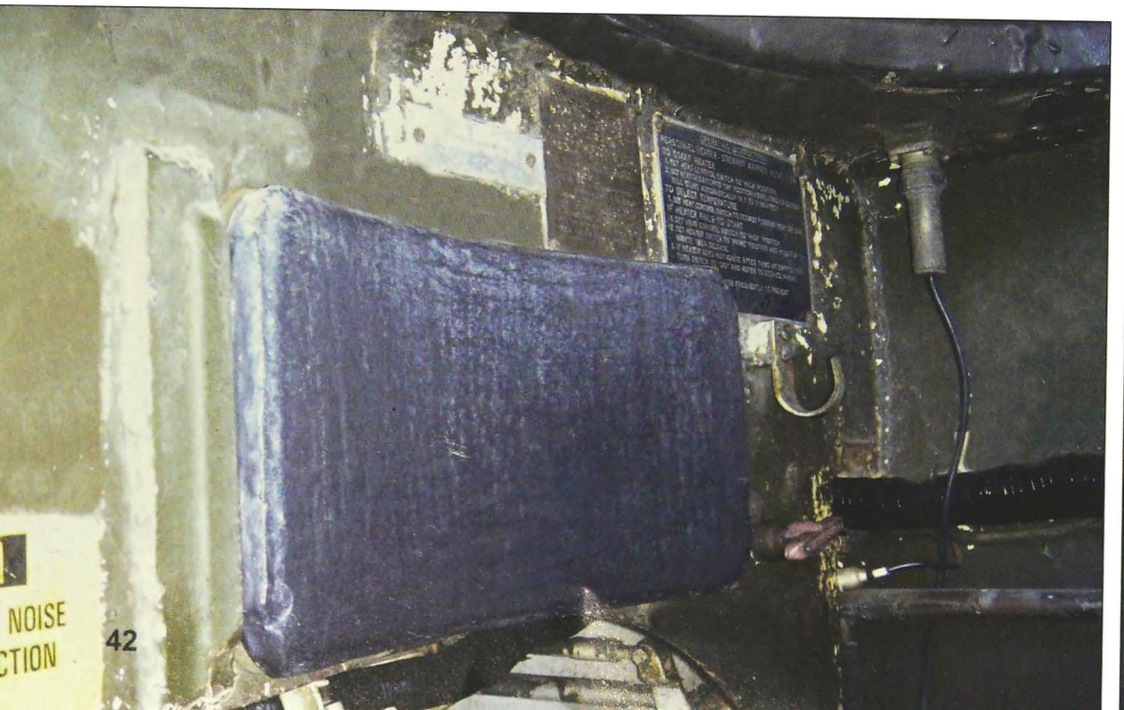


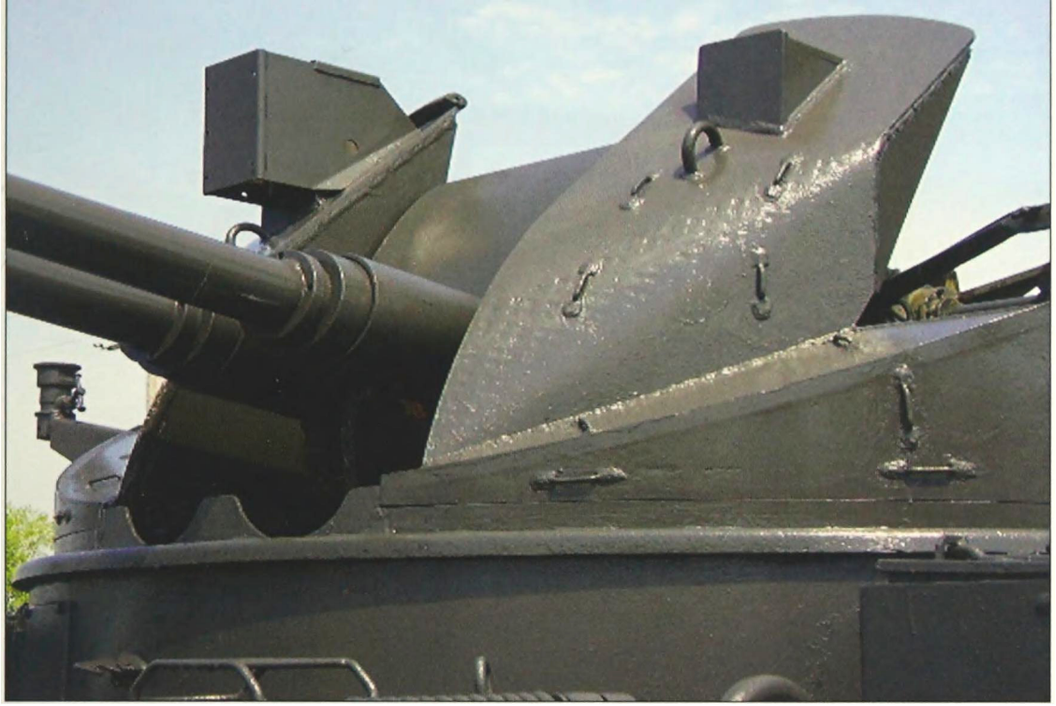
Ahead and to the right of the driver's seat is this range selector lever, which controlled the Allison crossdrive transmission. Maximum speed in low range, or reverse, was 11.5 mph. Ahead and slightly to the left of the range selector is the accelerator pedal. At the extreme left of the photo,the base of the steering T-bar is visible.

The two data plates adjacent to the driver's headrest describe the operation of the fire extinguishing and heating systems.

The instrument cluster mounting was a study in simplicity and eased maintenance procedures. When built, the Duster's wiring connections were made with the metal-shelled Douglas connectors, visible in the background.

The speedometer, with integral odometer, and tachometer, with associated hour meter, were mounted in the upper left corner of the driver's position. The maximum speed of the Duster on improved roads was 45 mph, but the cruising speed was 25 mph.





To a layman and to most veterans, this area is the Duster's turret. However, the Duster was a self-propelled antiaircraft gun, not a tank. Thus, this area is officially a mount, and official documents refer to it by this name. The Duster did have a turret though. It was a component of the fire control system. (Paul M. Hayward)

Two of the crew's secondary weapons were stowed inside the vehicle beneath the front door. Here are the upper portions of the two rifle racks. U.S. armored vehicle crewmen were typically provided with arms such as these so they could defend themselves in the event that the vehicle had to be abandoned.

The driver's hatch, like the commander's, was equipped to accept a periscope in a rotating housing, shown here.

Between the driver's seat and the range selector lever, the tunnel housing the front road wheel torsion bars can be seen.

The earliest Dusters had these conical flash suppressors installed on the guns. This style was widely used on Bofors guns during WWII.

Later vehicles used these three-prong flash suppressors, but the early versions of this style lacked the reinforcing rings present on these suppressors.

An oil-filled recoil cylinder was firmly mounted beneath each barrel. These cylinders are almost invariably missing from preserved vehicles. Protruding from the end of each cylinder is a control rod valve adjusting rod.

The flash suppressor most commonly found on Dusters in Vietnam is this three-prong type without reinforcing rings. Combat experience found them prone to cracking. Hence, they were often omitted, and the suppressors were redesigned. (Paul M. Hayward)

Footman's loops dotted the sides of the Duster's gun mount as well as the ammo rack sides. These loops were used to secure the issue canvas cover for the weapons and various items of personal stowage.

The recuperator springs were housed in cylinders surrounding the barrel bases.

Although they could be fired individually, the two cannon elevated in tandem. In power operation, the guns could be elevated to 85 degrees, but manually they could elevate to 87 degrees, shown here. The brass tube guide sleeves contrast with the olive drab barrels. (Stuart Robinson)

Though missing from this example, the same black padding found on the main ammo lockers was normally on each end of the ready racks.

Originally crewed by four men, the mount was cramped, even with the three-man crews often used in Vietnam. The yellow decal on the gun shield's back carries a high-noise area warning.

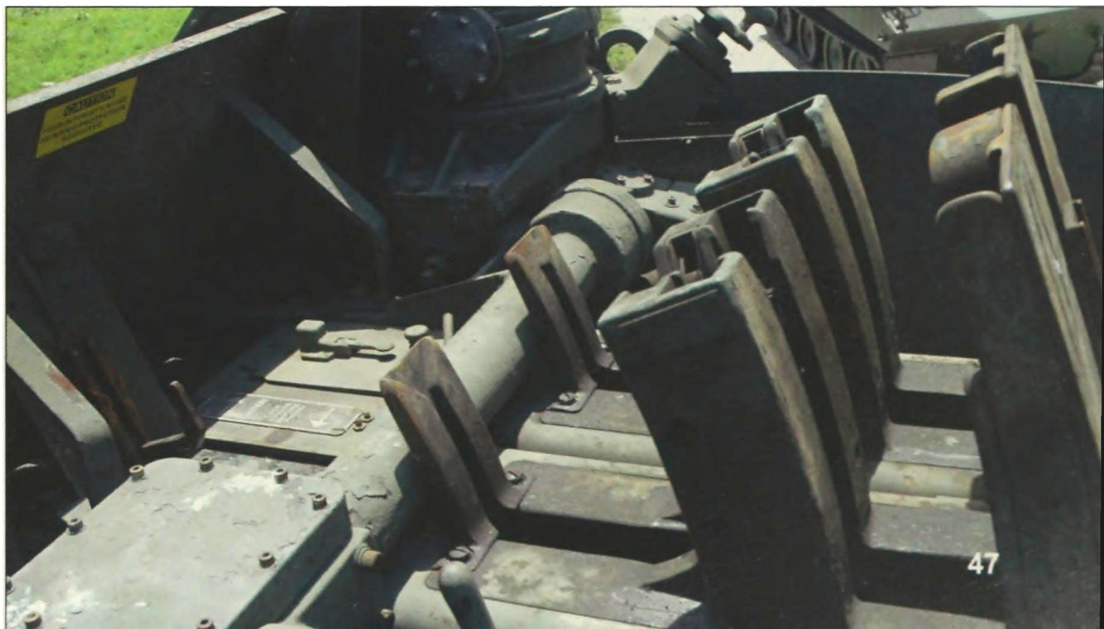
A heavy steel barrel rest was located between and below the guns, flanked by the equilibrators. Behind the barrel rest is the inverter box, which converts the vehicle's 24-volt DC electrical supply into the 115-volt AC current required by the mount.

The cannons were fed their four-round clips through these automatic loaders. The loaders were kept lubricated with general purpose oil.

Spring-loaded feed pawls and stop pawls forced the cartridges down to the breech and also prevented the rounds from being pushed upward.

The Dual Automatic Gun collectively was designated M2A1, and the mount was known as the M4E1.

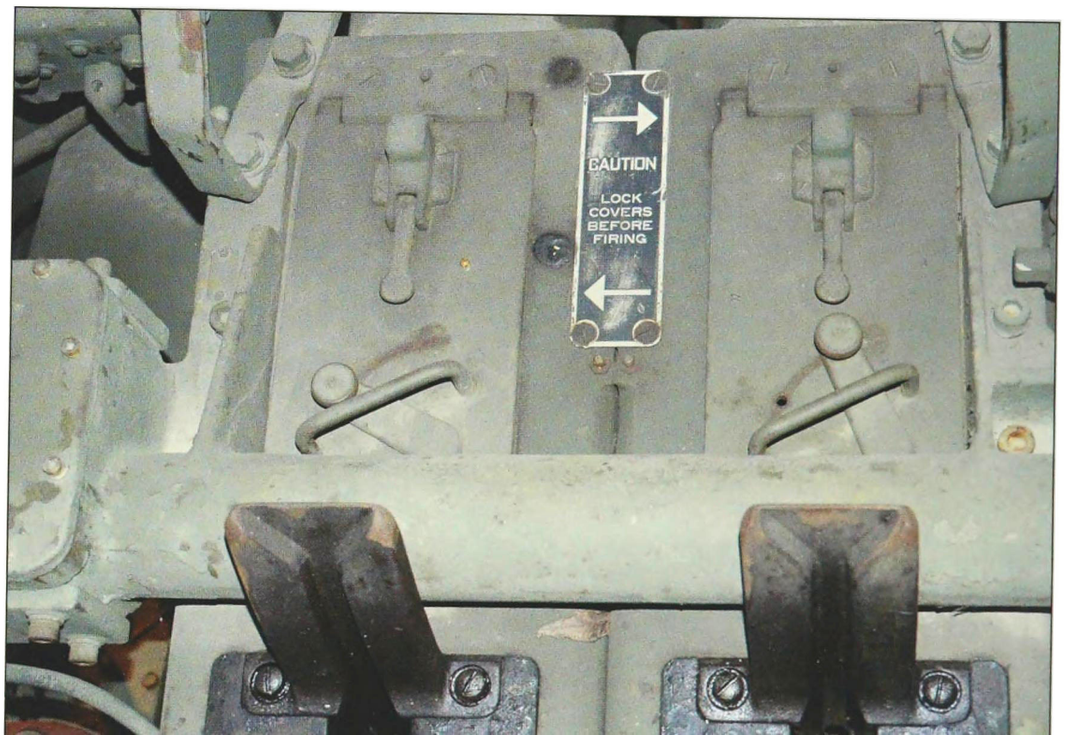
The biggest part of the cannons inside the walls of the mount were the automatic loading mechanisms. The breeches themselves are just forward of the large tube spanning the guns in this photo.



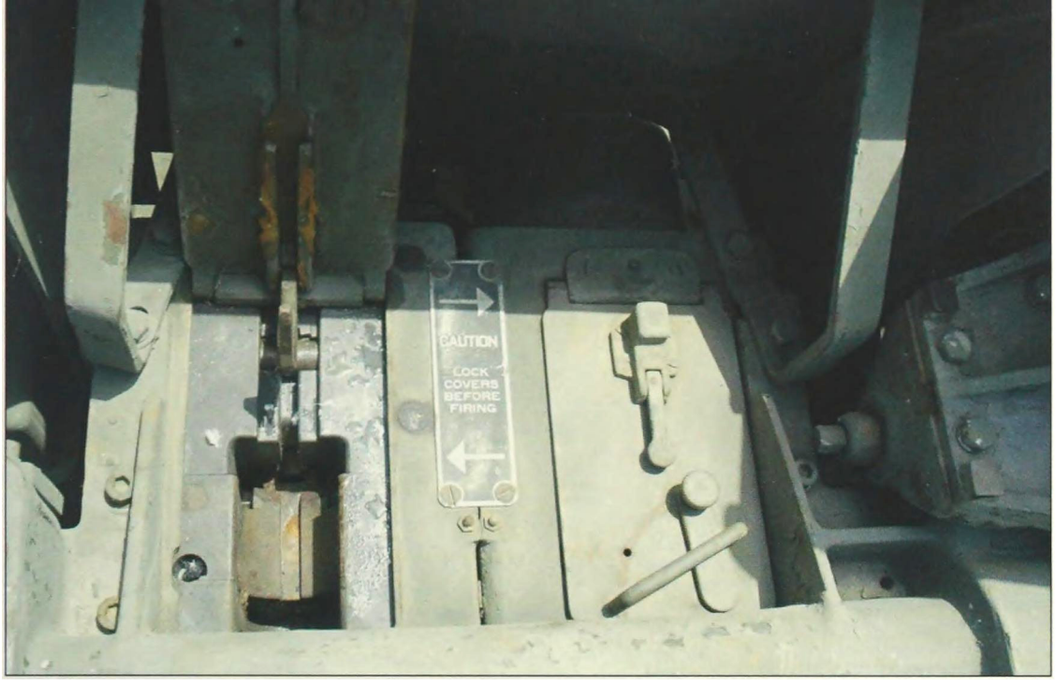
Though the feed mechanism had to be kept lubricated, the lubricant collected dust. In the dusty areas of Vietnam this caused operational problems.

Although the Bofors could fire 120 rounds per minute, heating issues limited this to one-minute intervals. Barrel life was considered 12,000 rounds.

In the event of a jam or misfire in one gun, the other weapon could continue firing. With the high rate of fire the weapons could maintain, concerns about cook off were real.



These covers provide access to the breech and were kept closed during operation of the weapons.

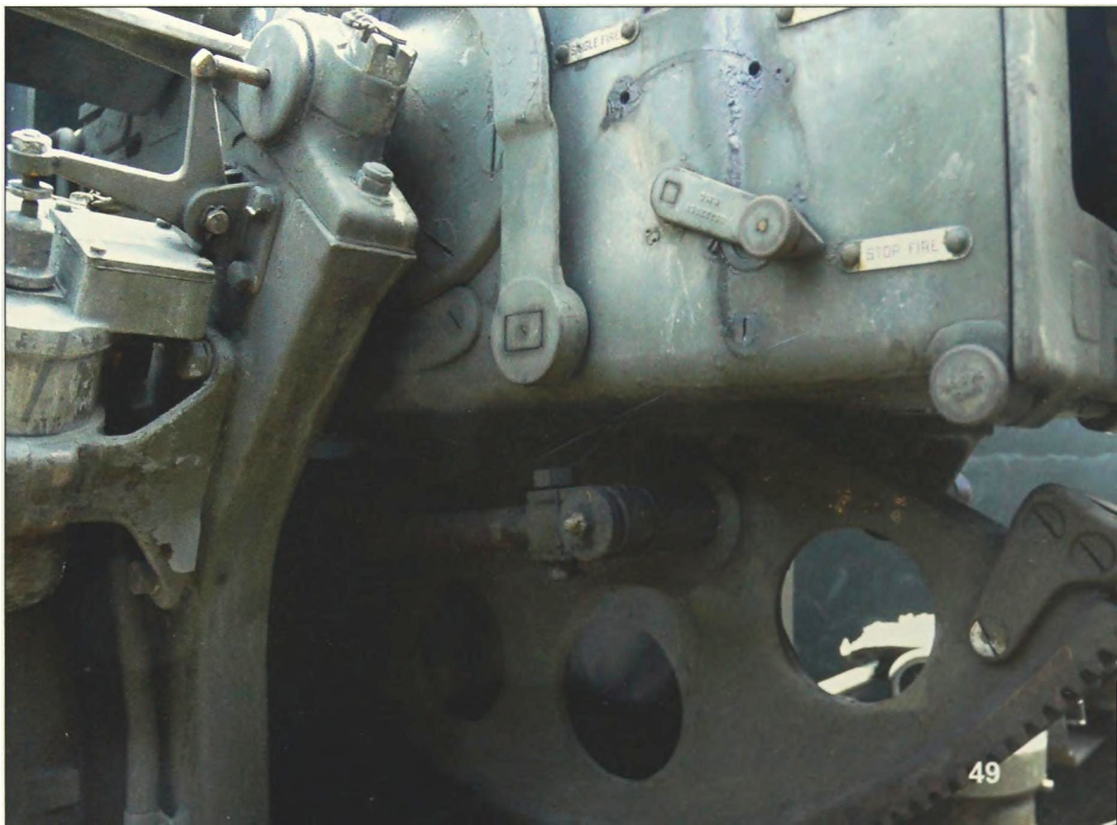


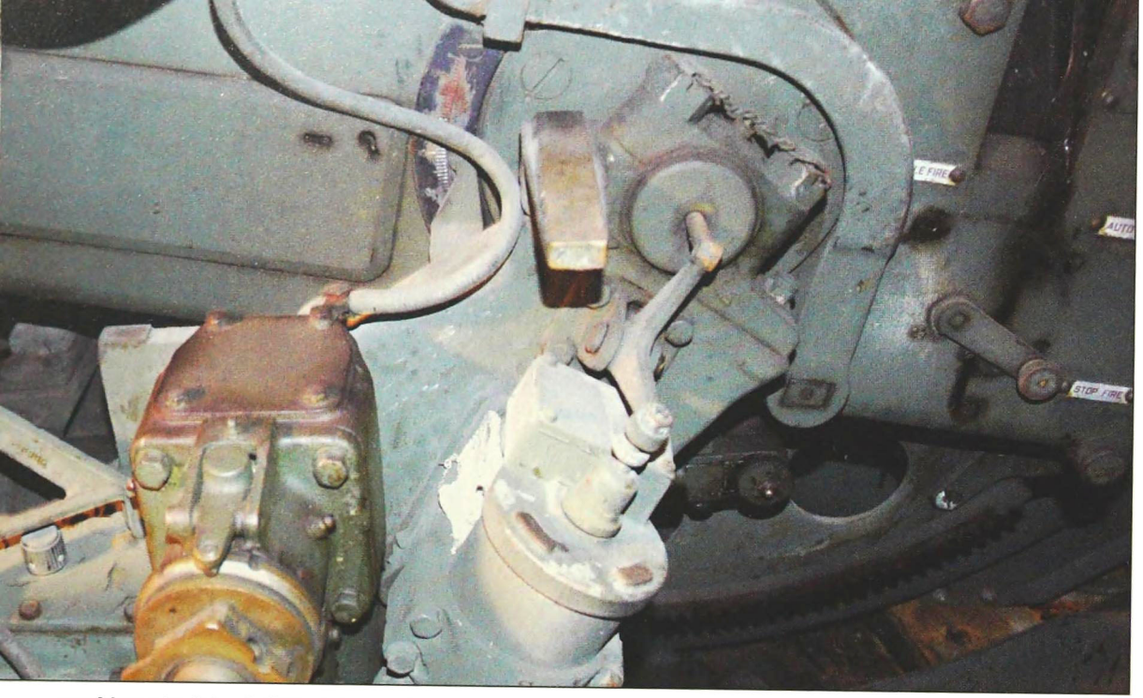
Each gun had its own S-shaped hand operating lever. This lever had to be pulled all the way to the rear in order to load or unload the automatic loader.

The opened left breech cover exposes the breech ring and breech block, which slides vertically in operation.

The elevating sector and its limit are located beneath the twin breeches.

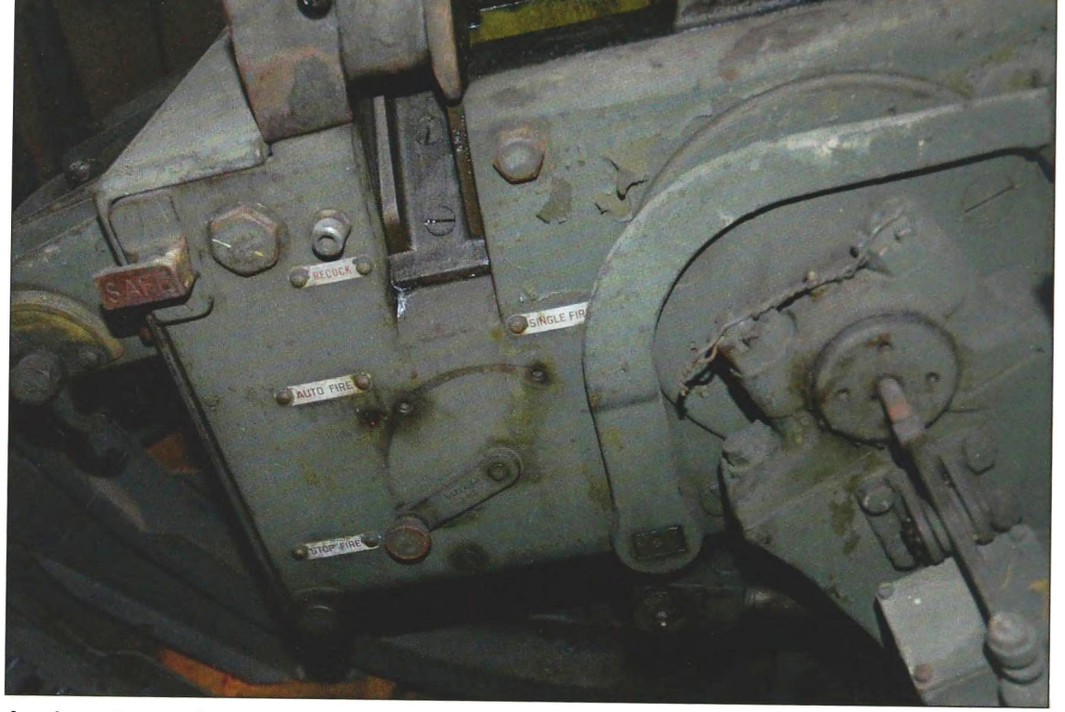
A fire selector lever on the weapon's side let the operator select *Stop Fire*, *Auto Fire*, or *Single Fire*.





Ahead of the left-hand gun's firing solenoid is the mountin point for the manual elevation crank. When in power mode, the handles were removed to prevent personnel injury.

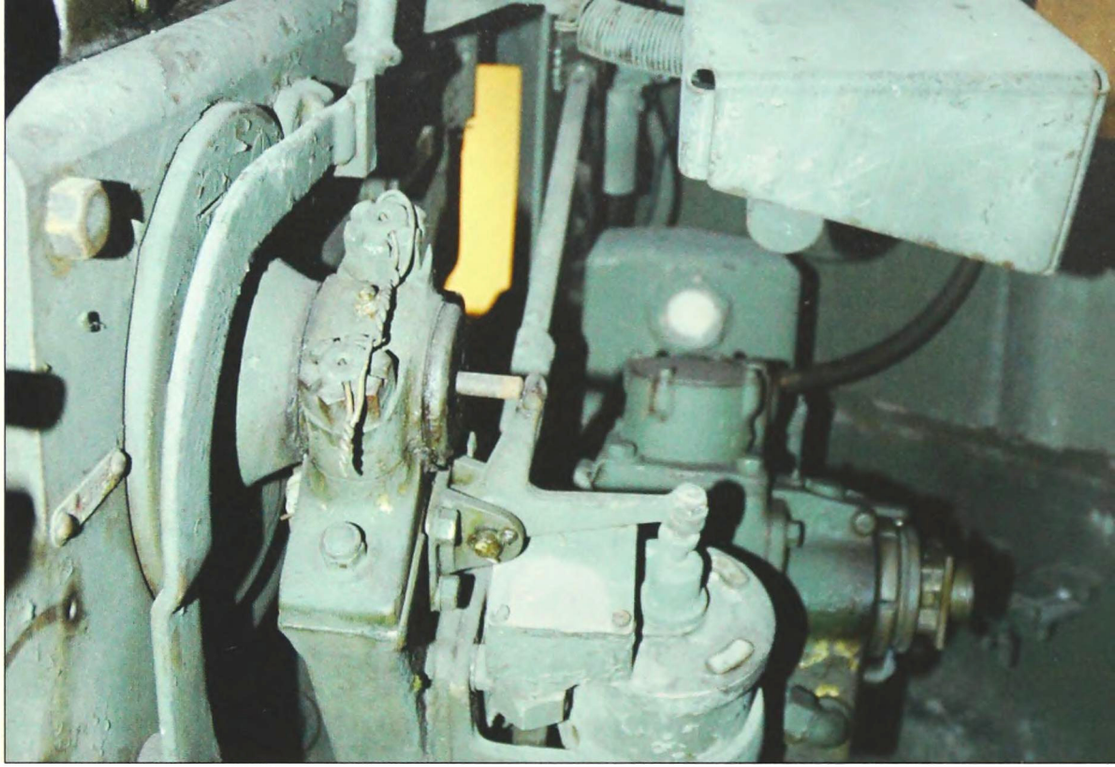
When in the forward "fire" position, the hand operating lever rested in this cradle. The weld bead visible in the background is a result of the demilitarization process and was not found on combat vehicles.



A mirror-image hand operating lever and fire selector lever were located on the right-hand gun. In the event of a misfire, the hand operating lever was pulled back until it struck the re-cock stop. The lever was then returned to the forward "fire" position, which actuated the firing pin again.

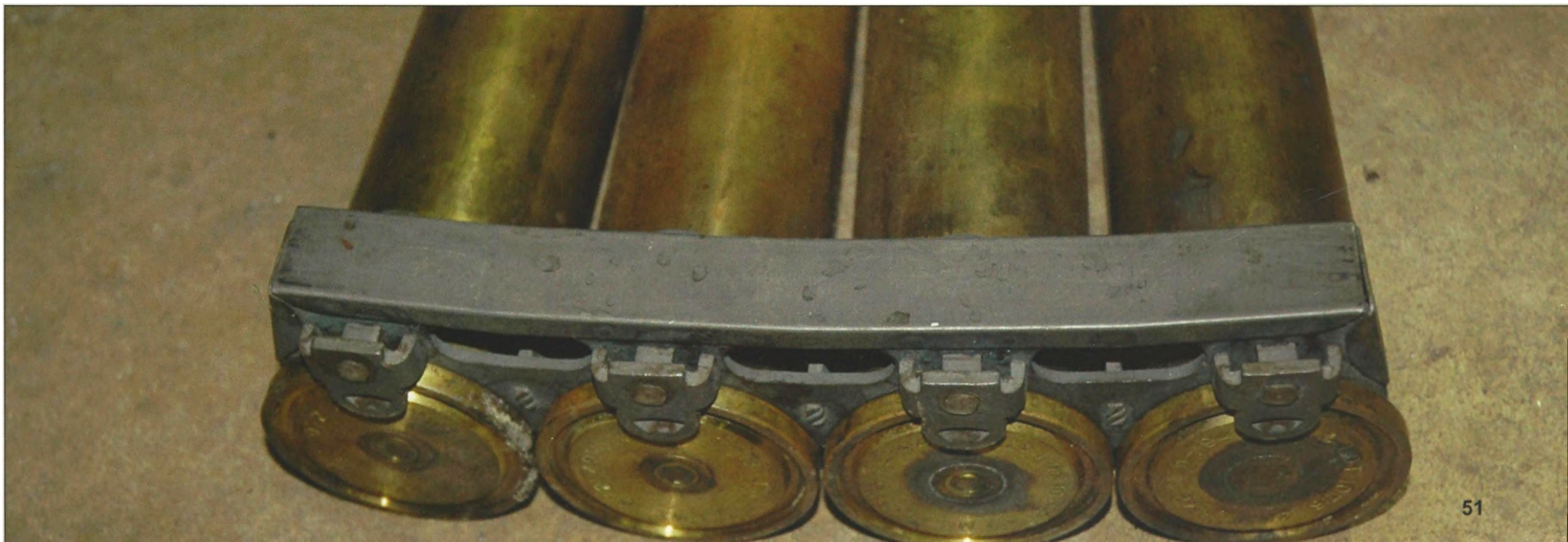
The firing solenoid actuated this lever, which pushed this rod to fire the gun.

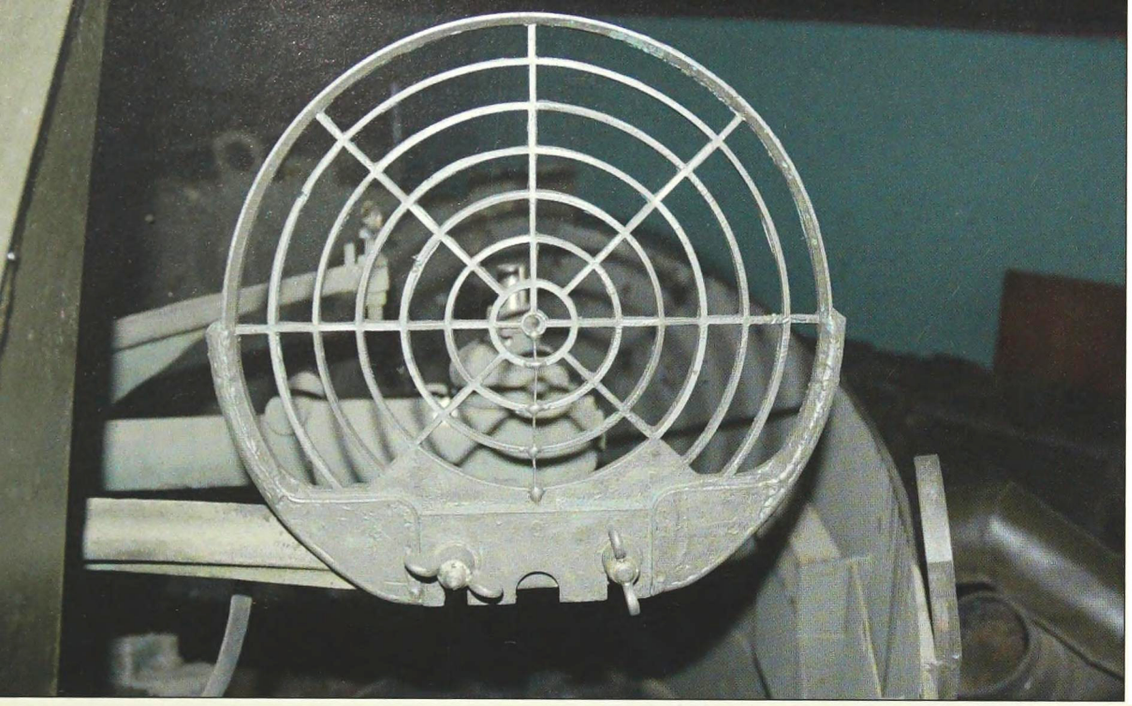
The right-hand side of the elevation sector differed slightly in appearance from the left-hand side.



In addition to being fired electrically by firing solenoids (right-hand side hown here), the guns could be manually fired with a cable operated by the gunner's foot.

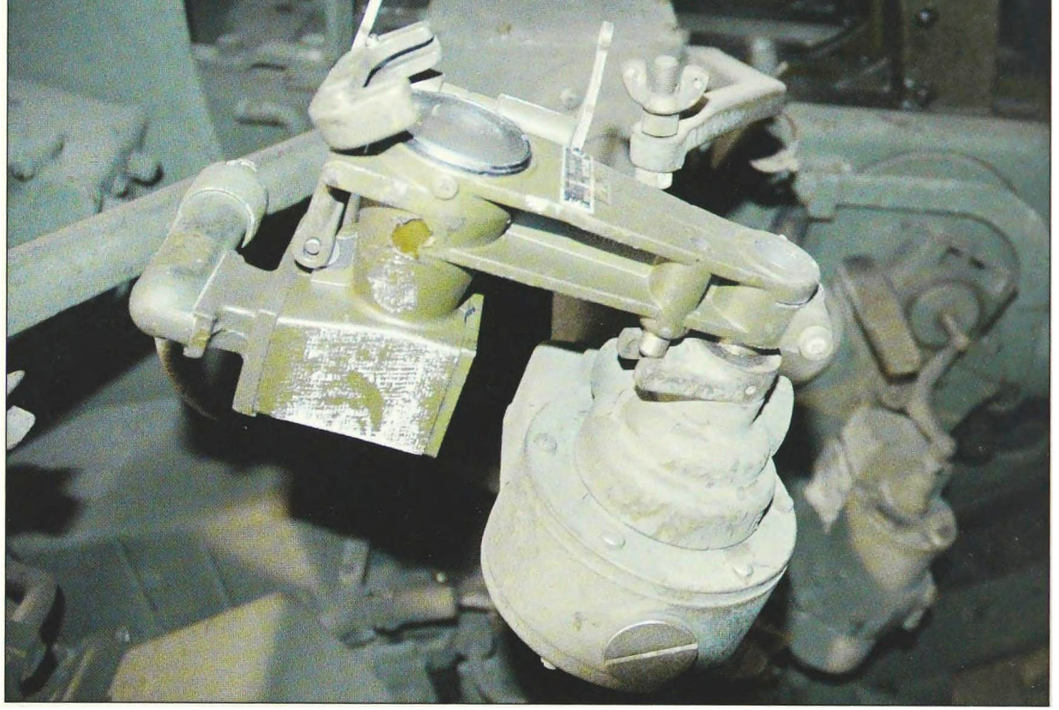
The Duster used five different types of Bofors ammunition. All were fed to the cannon in four-round clips such as this one.





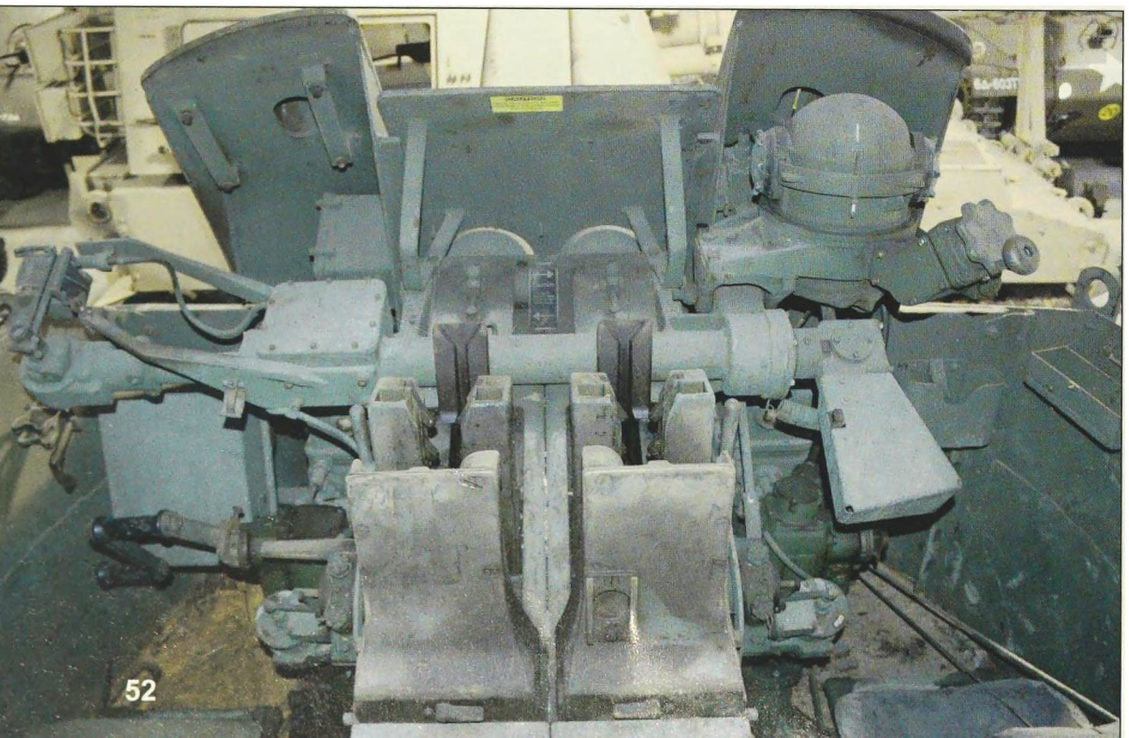
Identical and removable speed ring sights were provided for both the sight setter and gunner for use during manual mount operation.

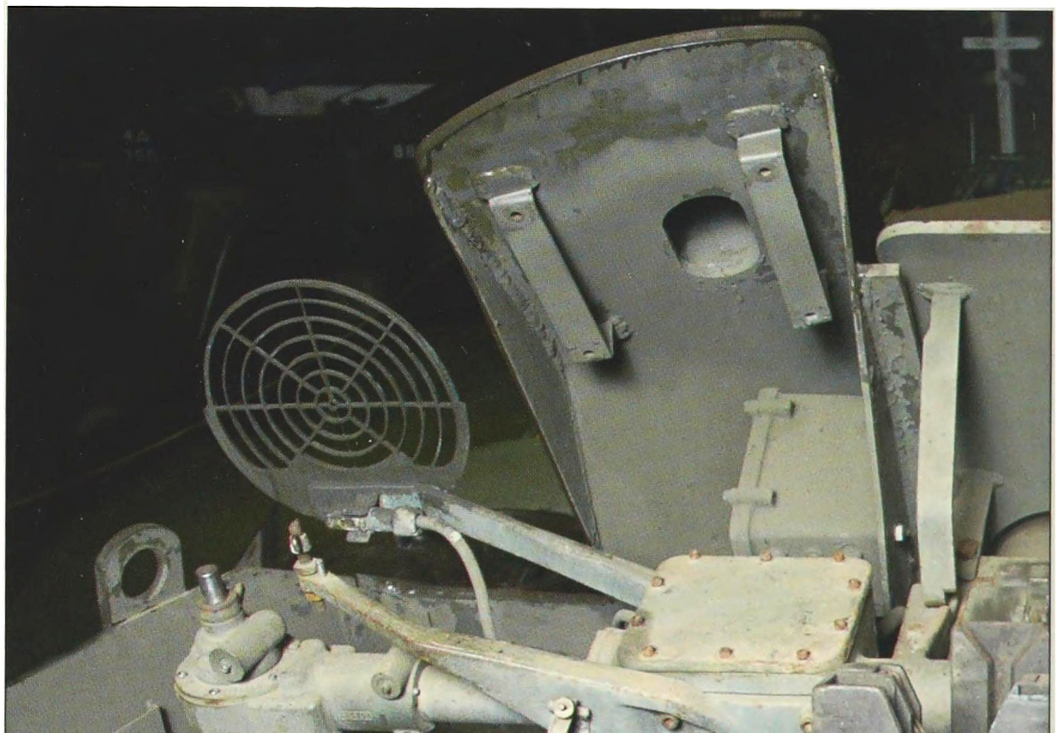
The manual elevation crank is installed in this example. The proximity to the gunner is apparent, which is the reason why the cranks must be removed and their drives must be disengaged prior to power operation.

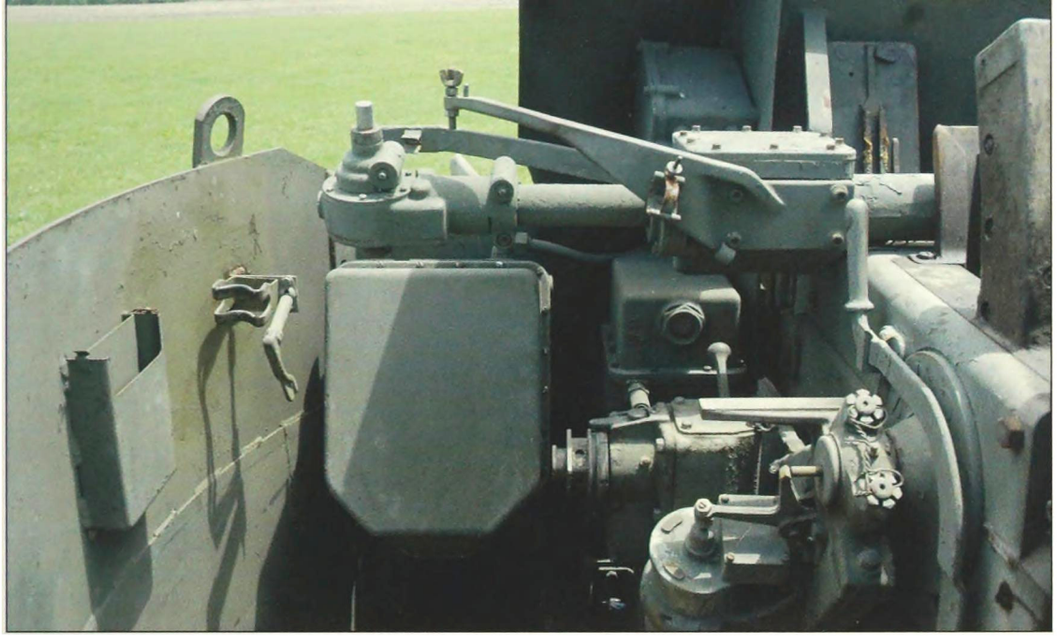


The weapon system was designed to use this illuminated reflex sight M24C (missing the glass reflector here). The M24C superimposed a reticle pattern in the gunner's line of sight.

The large box with 10 bolts securing its lid is located between the speed ring and the breech but is actually part of the computing sight M38.





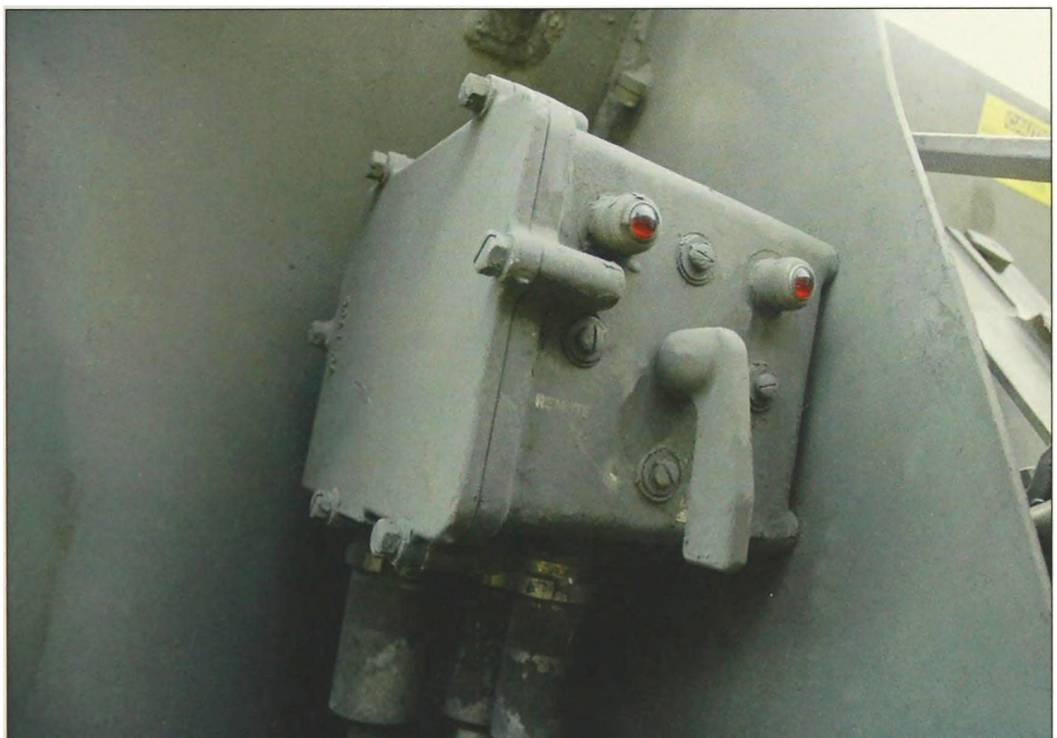


Directly in front of the camera is the M12E2 Drive Controller, shown here in the stowed position. To the left of the drive controller is the upper portion of a rifle rack. To the right of the controller is the Elevation Oil Gear M6A1E1 with sight glass visible. This oil gear elevates the cannons hydraulically.

Vehicles numbered 1,878 and below incorporated this control selector box on the gun shield's rear. The Duster was intended to have a single gun director to control one or more antiaircraft vehicles. Hence, this provision was provided though the concept was later abandoned.

The elevation switch is the lever just in front of the oil gear. This lever actually selected power or manual operation of the gun mount.

As mentioned earlier, the Duster does in fact have a turret, and officially this area is it. The lower portion of the M12E2 Drive Controller is defined as the turret. The central toggle switch turns the system on. Pushing and pulling the hand grips rotates the gun mount; tilting them elevates and depresses the weapons, and depressing the buttons on top of the grips fires the cannons.

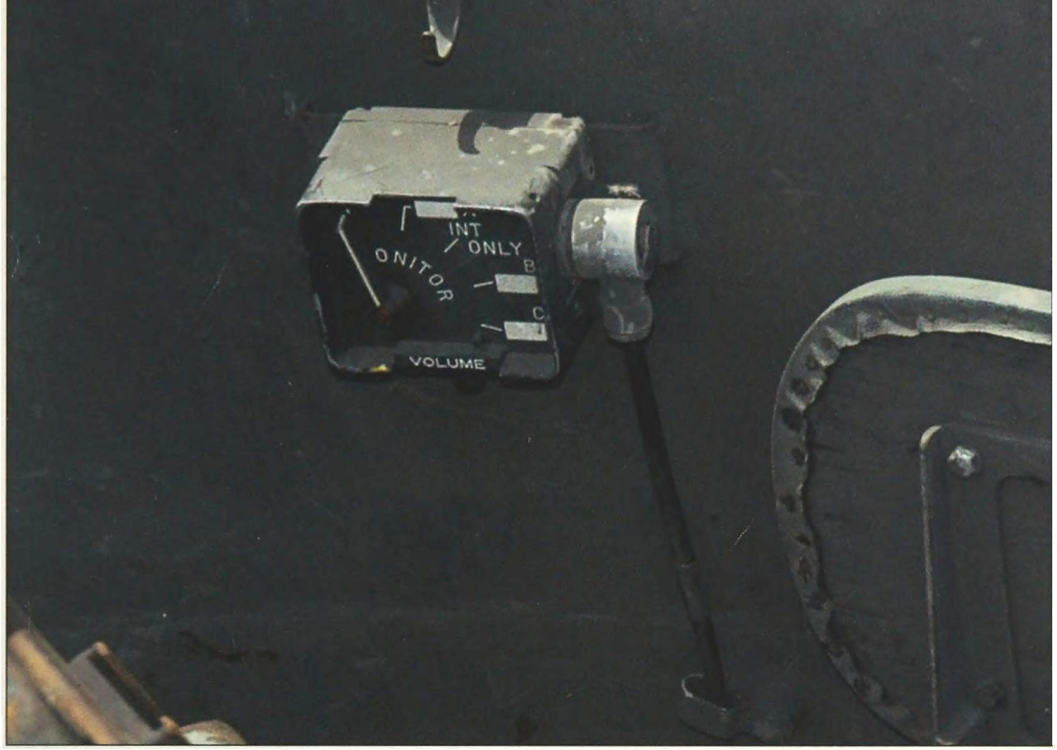


This foot pedal at the gunner's station fires the cannons manually. As long as ammunition is being supplied and this pedal is depressed, the guns will fire.

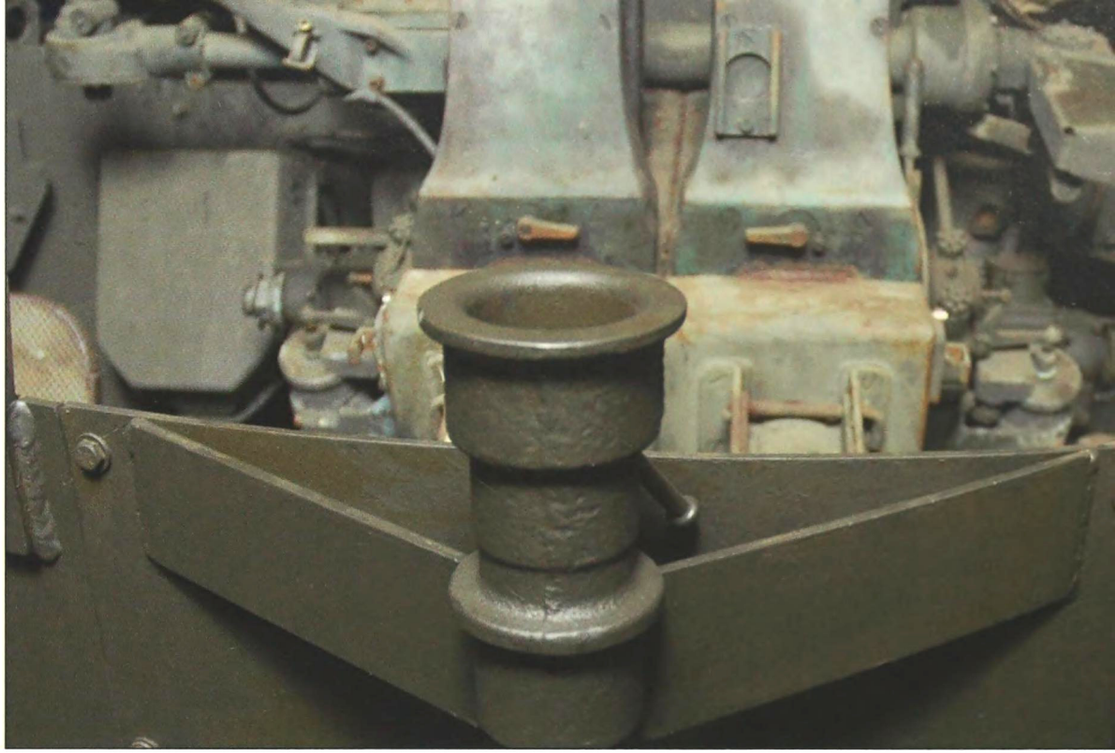
This lever in the gun mount floor, positioned forward and to the right of the gunner's seat, locks the traverse mechanism.

Duster stowage was tight, and the situation was compounded by its open top and relatively large crew. Hence, no space went unused. Even the gun mount armor's inner walls were peppered with numerous small stowage compartments.

The loaders' seats were bolted to the rear wall of the mount and were spring-loaded to automatically swing up and out of the way when not being used. An interphone box is adjacent to each seat.



The crew's headsets and microphones plugged into interphone boxes, which permitted communication between the men in the mount and those in the hull.



A socket, welded to the outside rear of the mount, held a pintle-mounted machine gun.

This cradle mounted the M1919A4 machine gun and also accepted an M2 Browning .50 caliber machine gun in the event the crew could "liberate" one. (John Adams-Graf)

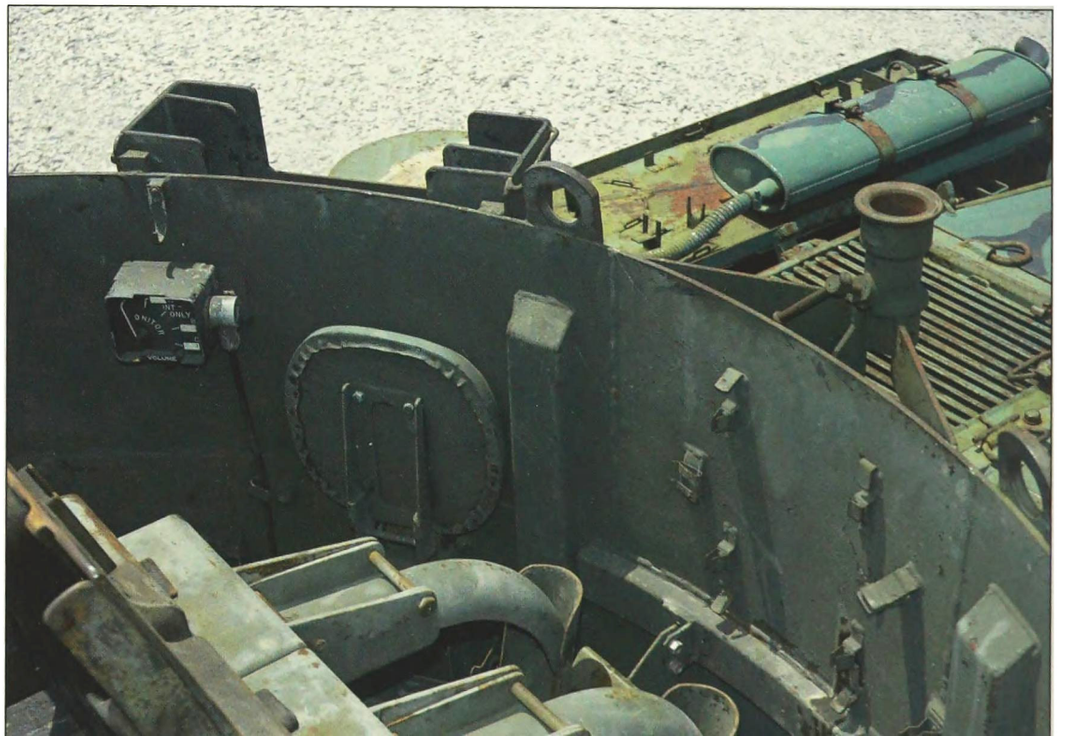
The locking screw handle naturally faced the inside of the mount.

This bracket, mounted on the left-hand side of the cradle, supported the ammo tray assembly when installed. (John Adams-Graf)

The cradle permitted elevation and depression of the weapon; rotation was achieved by turning the pintle in the socket. (John Adams-Graf)

Empty cartridge cases ejected out the rear of the autoloader assembly and slid down these chutes and out the bottom of the vehicle.

The ammunition ready racks were positioned just behind the loader's seats to permit immediate access.



The loaders' seat cushions, like all the bottom cushions in the vehicle, were covered with black vinyl. The basic form for the seat itself was made of plywood.

Each Duster carried 480 rounds of 40 mm ammunition with the bulk stowed internally in metal shipping boxes the ammunition plant used. Each fender's ammo locker carried additional rounds, and ready racks, such as this commander's side one, carried eight rounds.

Cartridge deflectors on the rear of the autoloaders guided the spent brass into the cartridge chutes.

Once past the chutes' end, spent brass fell through vehicle's bottom opening. (Paul Hayward)

The flexible machine gun could also be mounted in this socket adjacent to the sight-setter's position.

The inverted U-bolt appearing device on the mount is the locking bail, which locked the position of the cradle during travel. (John Adams-Graf)

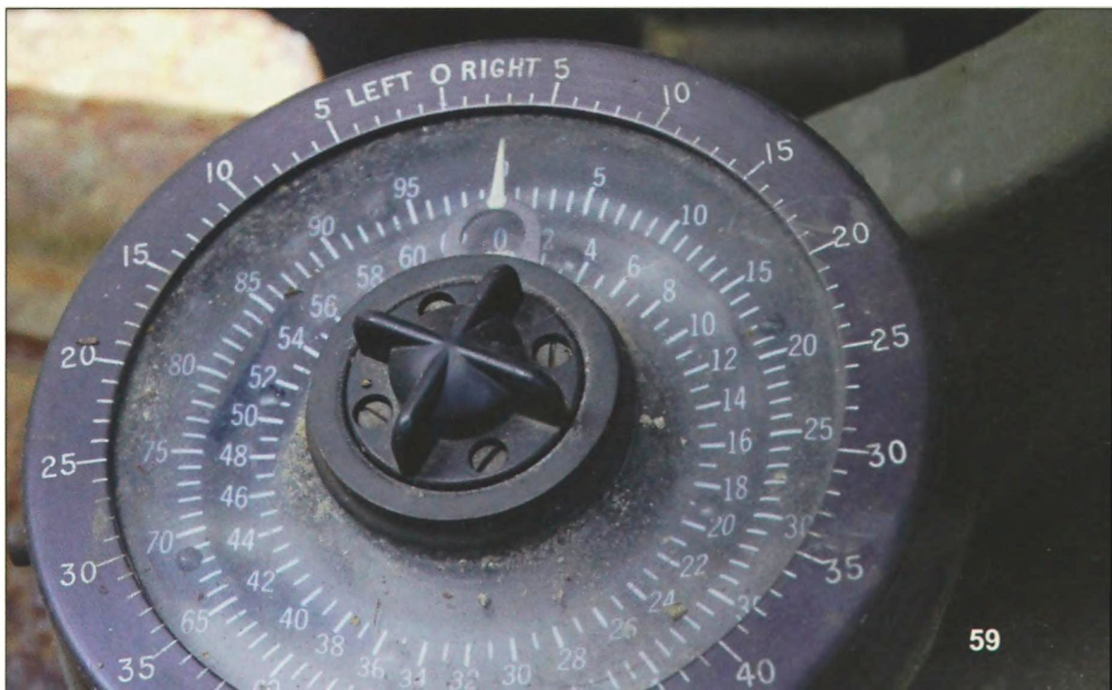
The machine gun, pintle, cradle, etc. were intended to move between the sockets, but many crews looked for extra weapons and cradles so both sockets were used all the time.

A chain retained the locking bail to prevent its loss in case of hasty removal due to enemy threats. (John Adams-Graf)

The machine gun mount was made from a bent piece of steel plate and does not appear nearly as robust from the rear as it does from the front.

This heavy steel cap covered the azimuth indicator when it was not in use. A small chain prevented its loss.

The azimuth indicator precisely indicated the rotational position of the mount, an important consideration for indirect or antiaircraft fire.



The sight setter's firing solenoid and lever were mirror images of the ones on the gunner's side.

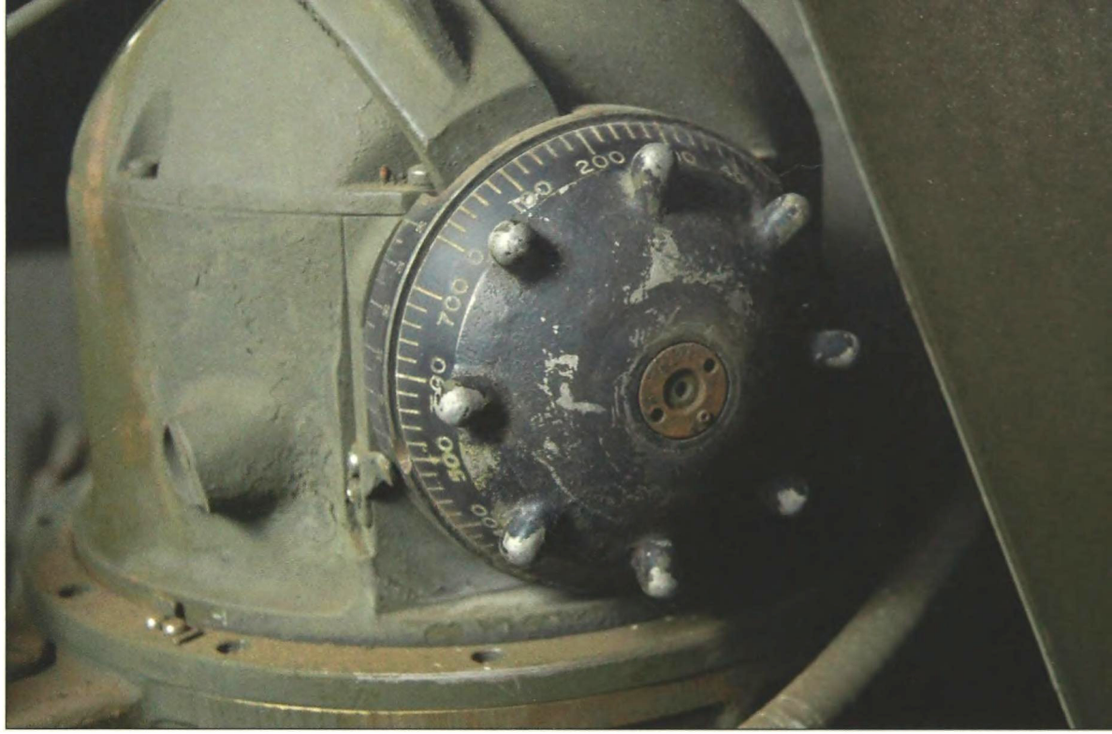
Ammunition for the machine guns was stowed in small boxes inside the mount. (Fort Bliss via Paul Hayward)

This ball-like device is the mechanical computer that is the key part of the Computing Sight M38.

The ball supported the flight direction indicator and was manually pivoted to correspond with the angle of climb or dive of the target.

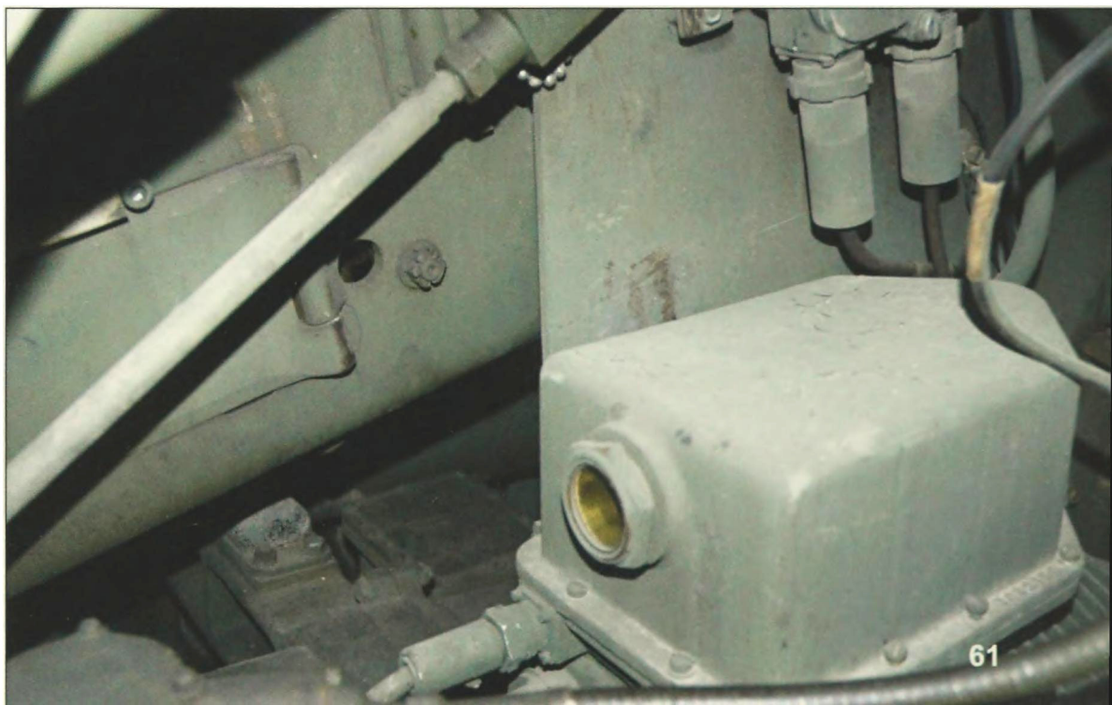
A canvas dust cover was permanently affixed to the bottom of the computer to protect the delicate swivel shaft from dust and snow.

The computer positioning hand wheel, mounted to the right of the computer, was used to rotate the computer in azimuth so that the flight direction indicator was placed in the direction of the target flight,and parallel to the target course.



A speed knob was located on either side of the computing sight.The knob had 20-mph increment units that went from zero to 700 miles per hour. The knobs were used either together or separately to set the estimated speed of the target.

A second oil gear system on the sight setter's of the weapons drove the mount in traverse.



A binoculars rack and first aid kit bracket were affixed to the inside forward portion of the mount armor on the sight setter's side. The armor of the mount sides was a mere .3-inches thick.

Directly behind the lower center portion of the gun shield was the electrical distribution box that connected all the major 24- and 115-volt circuits of the mount.

Welded to the right side of the gun shield was an antenna mount. The gun shield armor was .5-inches thick.

As built, the Dusters were equipped with these cast cylindrical antenna mounts on both the left- and right-side of the gun shields, which were designed to accept the mast base AB-15/GR. Note the "waffle" pattern surface on the front plate. (John Adams-Graf)

Though naturally enough for antiaircraft artillery, the Duster's guns could elevate to near-vertical—its greatest use was against ground targets. Against aerial targets the guns had a range of 1650 meters, against ground targets the range was increased a further 200 meters. (Stuart Robinson)

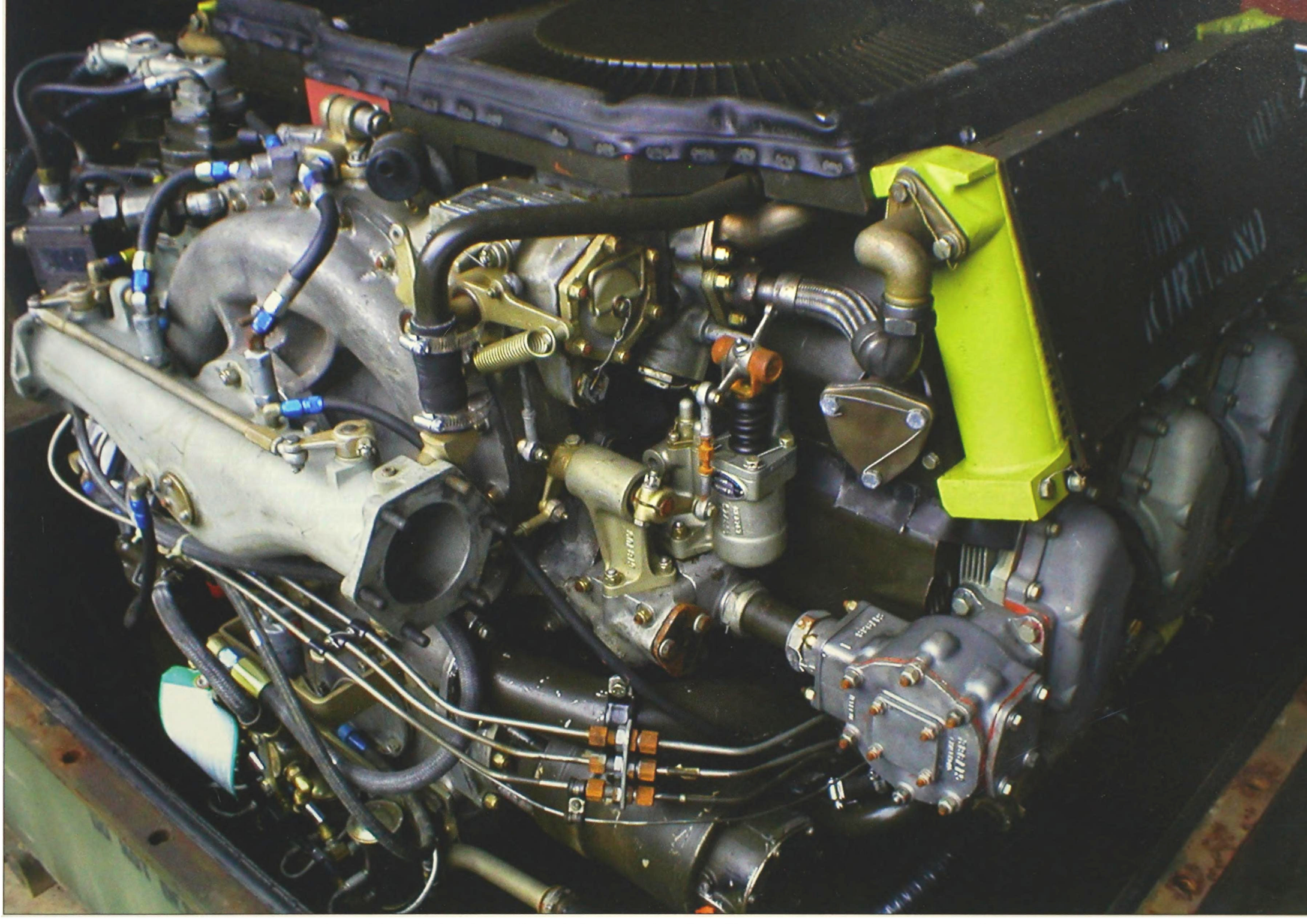
Like the M41, the M42's exhaust heat would quickly burn the paint off of the mufflers. The M42 normally had heat shields that protected the mufflers, which are absent on this vehicle undergoing restoration, but even theheat shields' paint would burn off, though to a lessor degree than what is shown here.

The most noteworthy combat use of the Duster in Vietnam was against ground forces even though these vehicles lacked adequate armor protection for such use. Crewmen often equipped themselves with flak jackets, especially when on convoy escort duty.

The Duster was conceived as only a part of an antiaircraft defense system, which included a self-propelled battery director. However, the latter was never produced and made the Duster something of an orphan, especially against fast-moving jet aircraft. (Stuart Robinson)

When ready for combat, the M42 tipped the scales at 49,500 pounds. The driver was seated in the left front, and the commander was seated to his right. The remaining four crew members were substantially more exposed inside the gun mount.

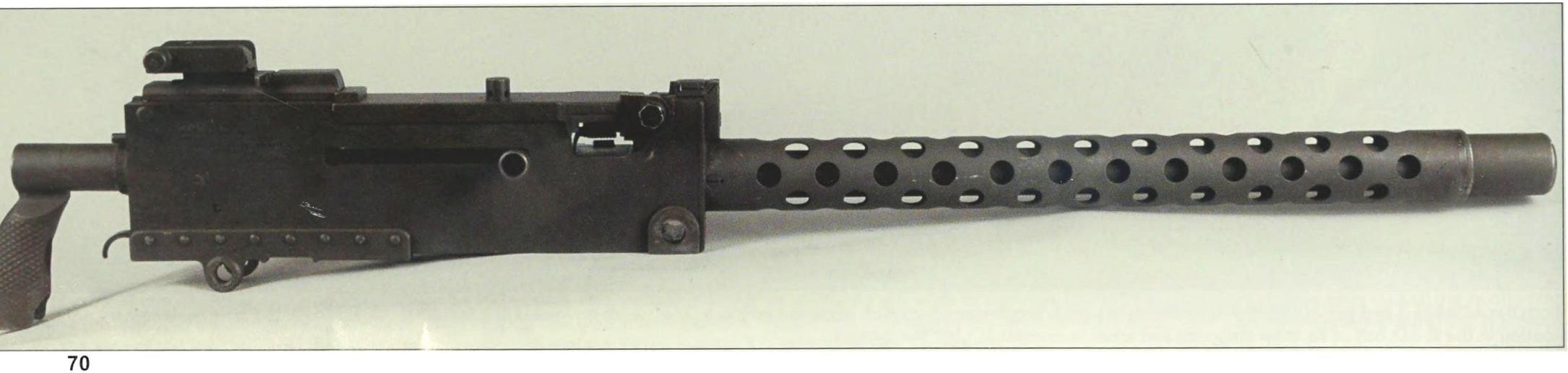
The crew of this nearly-new Duster make ready for inspection. This vehicle is equipped with the early style of the three-prong flash suppressor. This style lacked the reinforcing rings surrounding the prongs found on later suppressors. The type shown here is the style most commonly found on Dusters in Vietnam. The three-piece cleaning rod is stowed on the side of the hull, beneath the tow cable. The coloration of the T91E3 track is interesting as well. (ADA Fort Bliss)



Both the AOS895-3 and the AOSI895-5 were 895 cubic-inch, 6-cylinder air-cooled, opposed engines. They were governed at 2,800 RPM. Shown here is a new replacement engine nestled in the lower half of its steel shipping and storage container. (Jeff Symanski)

The German MG42 machine gun of WWII is arguably one of the best-engineered weapons of that war. Not surprisingly, captured examples of these guns were carefully studied during the war and for some time afterward. Drawing from these studies, the M60 general-purpose machine gun was developed, and production began in 1957. Notable characteristics drawn from the MG42 are the quick-change barrel and the feed mechanism. The 7.62-mm M60 was used as a door mount weapon on helicopters and as a mounted weapon on various tactical vehicles, but its primary use was as a squad weapon. As a squad weapon the gun was equipped with a bipod. Infantrymen in Vietnam complained about the weapon's 23-pound weight and tendency to jam, particularly when exposed to dust. The gun was supplied with an asbestos glove to be used when changing hot barrels hot sustained fire.

The M1919A4 .30 caliber machine gun served GIs through WWII and Korea, but by the time US troops arrived in Vietnam in significant numbers, the gun had been rendered obsolete. However, significant numbers of these guns had been supplied as military assistance to ARVN, and limited numbers remained in U.S. inventory. Because of the weapon's long service history with the U.S. military, many soldiers in Vietnam were familiar with the weapon and employed it even if not authorized. Fed by 250 round belts, the weapon had a 400-500 round-per-minute cyclic rate and weighed 31 pounds. The bulk of the roughly 450,000 M1919A4's purchased by the military were made by the Saginaw Steering Gear Division of General Motors, although Rock Island Arsenal and Buffalo Arms Company each produced just over 30,000 weapons.



When built, the Duster received racks and stowage appropriate for the small arms issued with the vehicle. The standard arms issued at the time of the Duster's introduction were five .30 caliber M2 carbines and an M3A1 (Grease Gun) Submachine gun, shown here.

Typically, the drive and commander each stowed their personal weapon in the lower front right hull. The *cups* that went with their personal weapons are clearly visible in this photo.

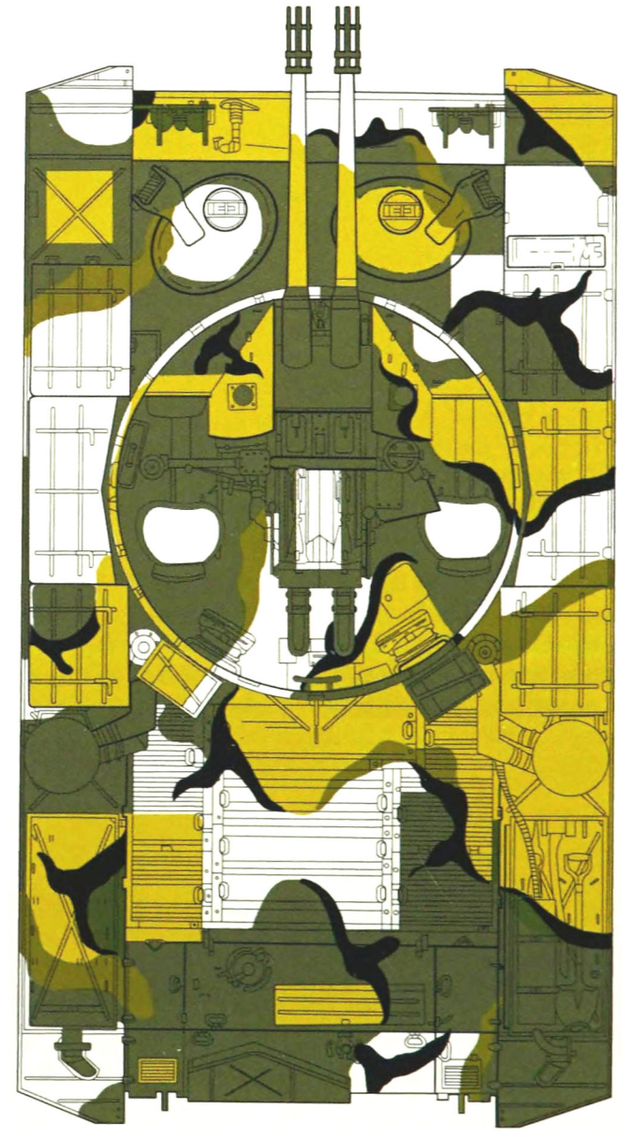
The M16 has become the symbol of the US GI in Vietnam. The weapon's design originated with Eugene Stoner and was licensed to Colt for production. The Air Force initially procured the gun, and Air Force security troops used it. After considerable testing in 1965, the M-16 was type-classified Standard A and became the issue rifle for soldiers in Vietnam. Once fielded, soldiers found the weapons were terribly susceptible to jamming and became very unpopular amongts troops. In 1967, th improved model M16A1 was introduced. This weapon had been redesigned in an effort to eliminate the jamming problems common in the earlier model. The A1 was classified as Standard A in 1967. Like the M16, the M16A1 was capable of semi-automatic and automatic fire and had a practical rate of fire of 60 rounds-per-minute. The weapon had an effective range of 300 meters.

NO.	ABBREVIATION	COLOR
1	W	White
2	DS	Dessert sand
3	S	Sand
4	EY	Earth yellow
5	ER	Earth red
6	FD	Field drab
7	EB	Earth brown
8	OD	Olive drab
9	LG	Light green
10	DG	Dark green
11	FG	Forest green
12	BL	Black

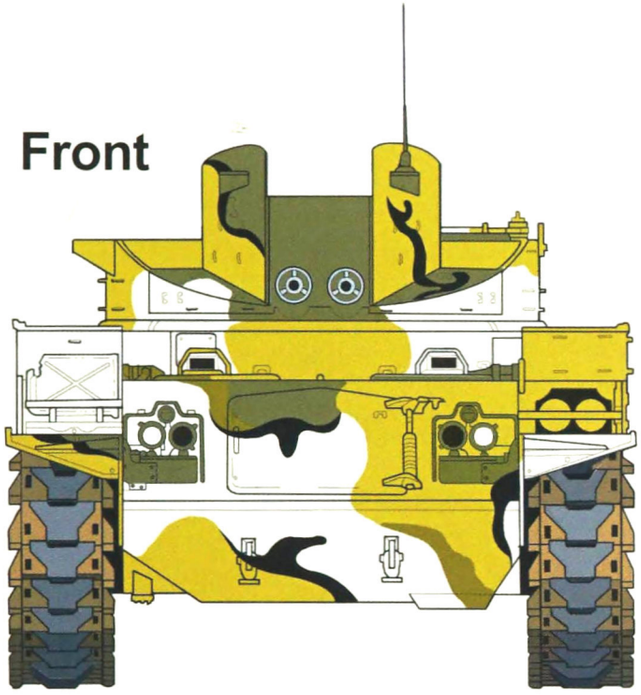
This chart was used in conjunction with these painting diagrams, when the Duster paint scheme changed from overall semigloss OD to the MERDC scheme.

COLOR CODE CONVERSION USED IN MERDC SCHEME			
	National Stock Number		***FS595A***
Color	**5 Gallon**	**1 Gallon**	**Color Code**
Desert Sand	8010-00-111-8353	8010-00-111-8004	33637
Sand	8010-00-111-8336	8010-00-111-7988	30277
Earth Yellow	8010-00-111-8130	8010-00-111-7968	30257
Earth Red	8010-00-111-8345	8010-00-111-8003	30117
Field Drab	8010-00-111-8129	8010-00-111-7943	30118
Earth Brown	8010-00-111-8338	8010-00-111-7998	30099
Olive Drab	8010-00-111-8069	8010-00-111-7940	34087
Light Green	8010-00-111-8007	8010-00-111-7930	34151
Dark Green	8010-00-111-8042	8010-00-111-7938	34102
Forest Green	8010-00-111-8010	8010-00-111-7937	34079
Black	8010-00-111-8356	8010-00-111-8005	37038

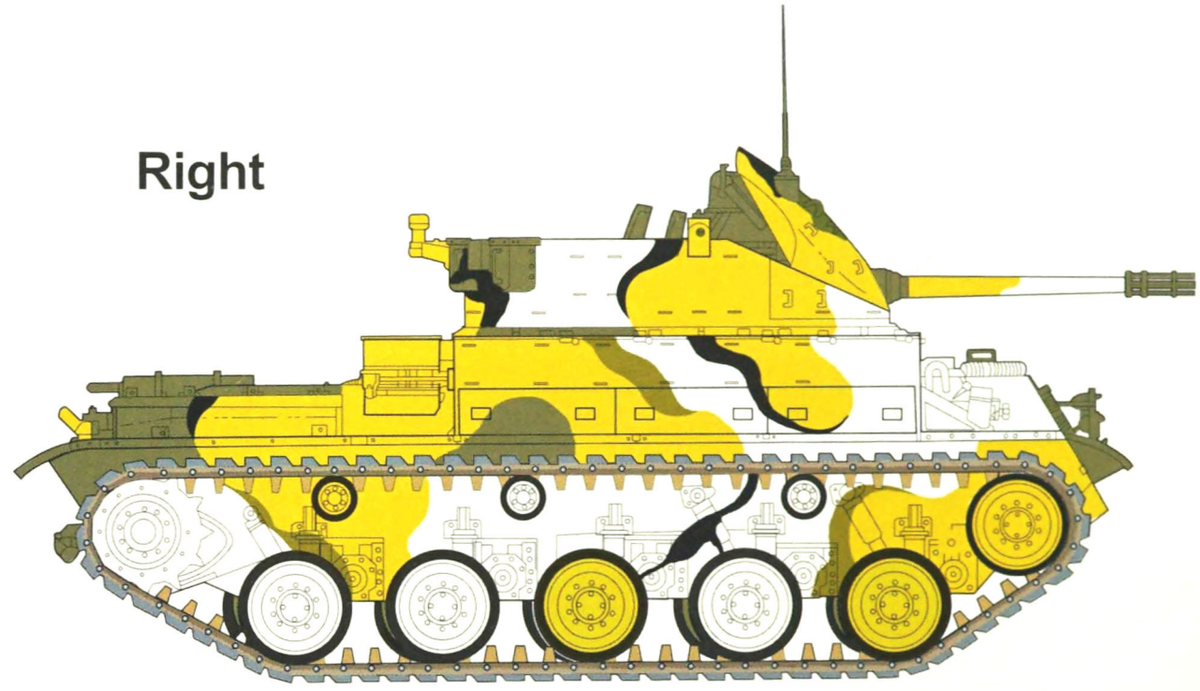
Top



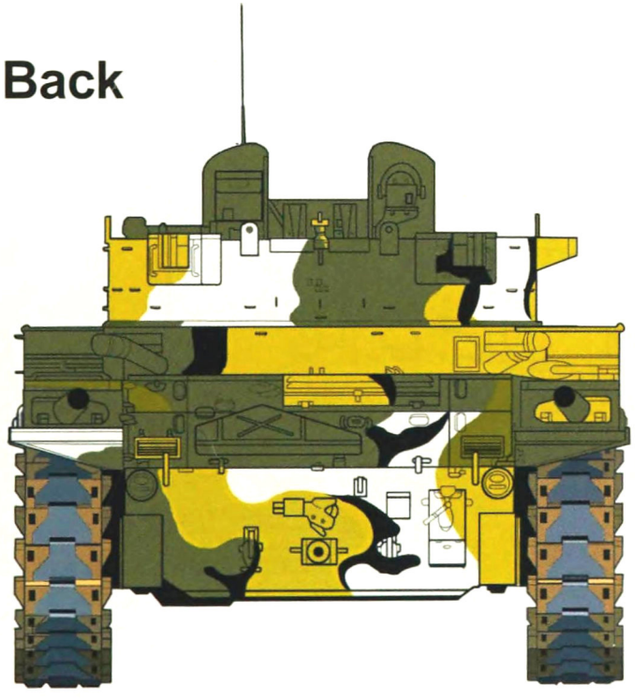
Front



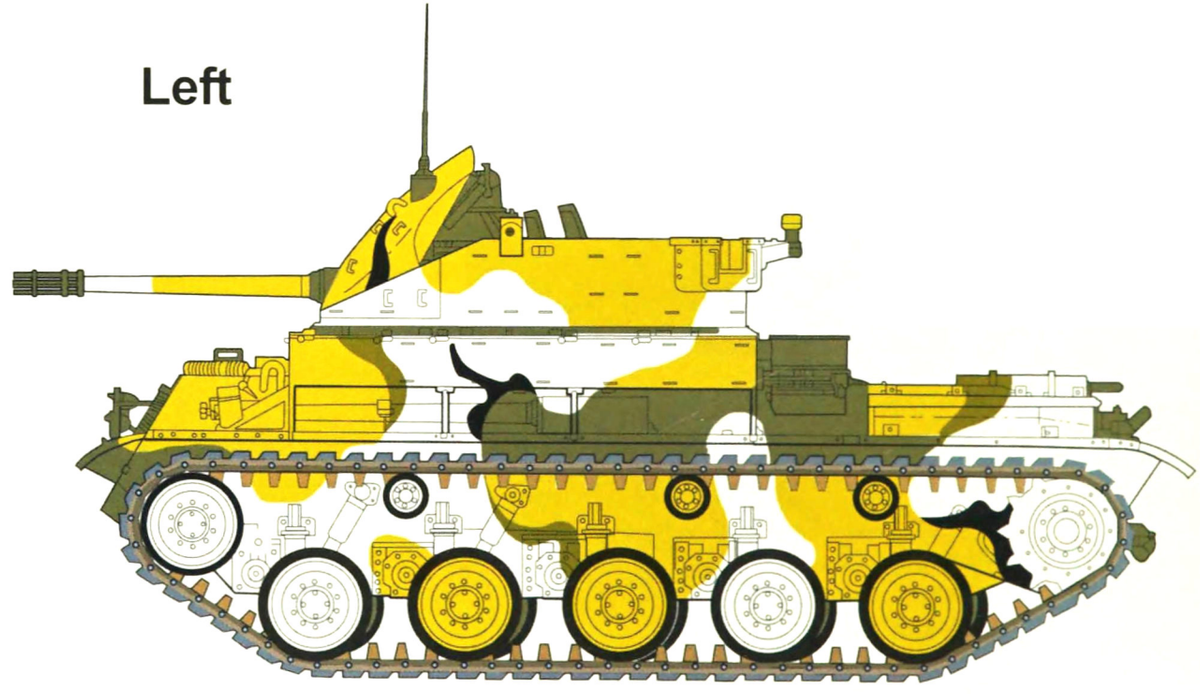
Right



Back

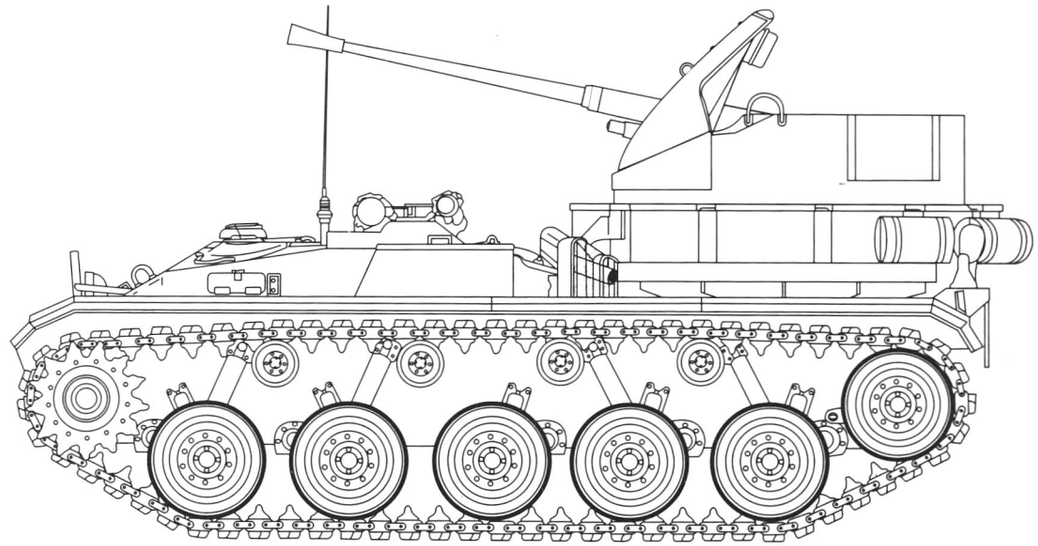


Left



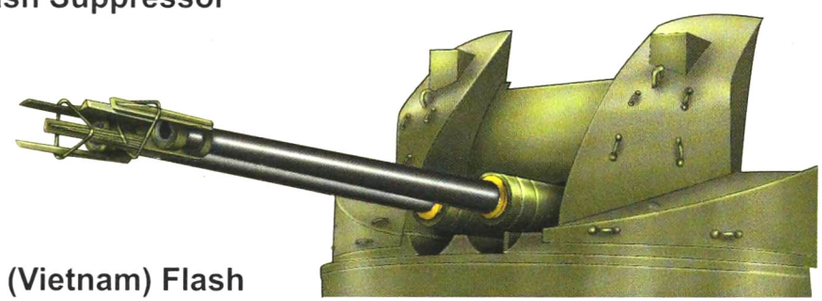
Crew ..... Four
Length ..... 26 feet, 10.8 inches
Height ..... 8 feet, 10.8 inches
Weight ..... 51,796 pounds
Main armament ..... 76 mm cannon
Engine ..... 500-horsepower Continental AOS-895-3
Speed ..... 44.7 mph
Range ..... 100 miles

M19 Gun Motor Carriage

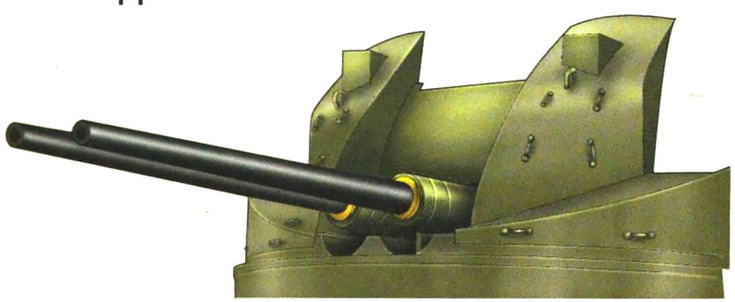


Flash suppressor

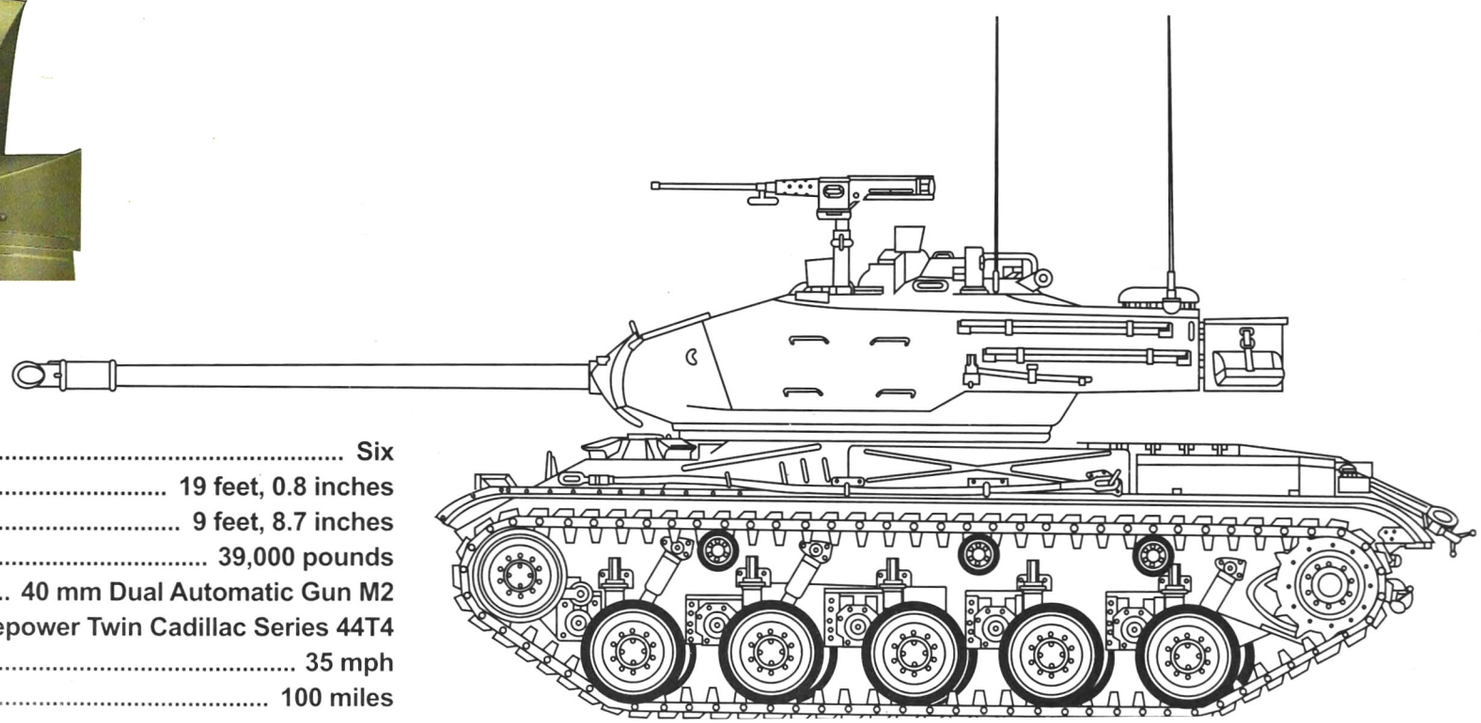
M42 Three-Fork Flash Suppressor



M42 (Vietnam) Flash Suppressor Deleted



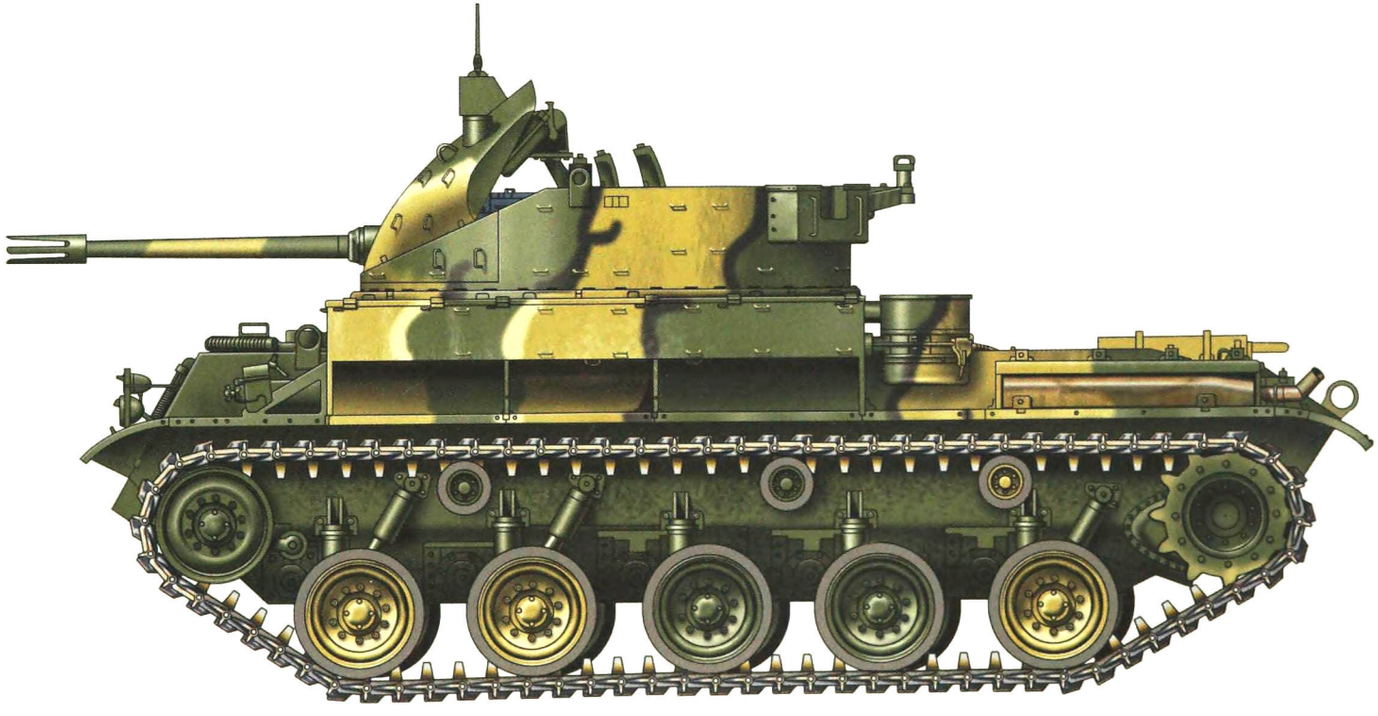
M41 Walker Bulldog



Crew ..... Six
Length ..... 19 feet, 0.8 inches
Height ..... 9 feet, 8.7 inches
Weight ..... 39,000 pounds
Armament ..... 40 mm Dual Automatic Gun M2
Engine ..... 296-horsepower Twin Cadillac Series 44T4
Speed ..... 35 mph
Range ..... 100 miles

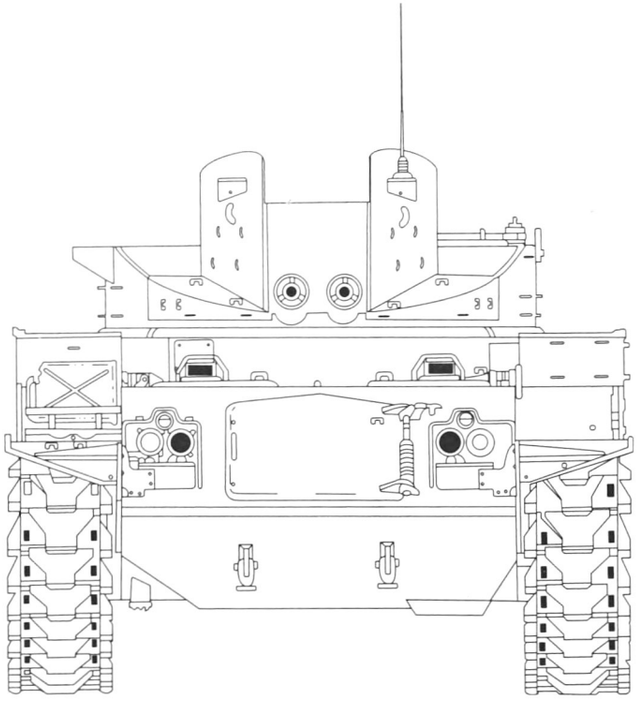
Old Dusters never die; they just guard gates and stand-to for their ghostly crews of the past to join them. (Paul M. Hayward)

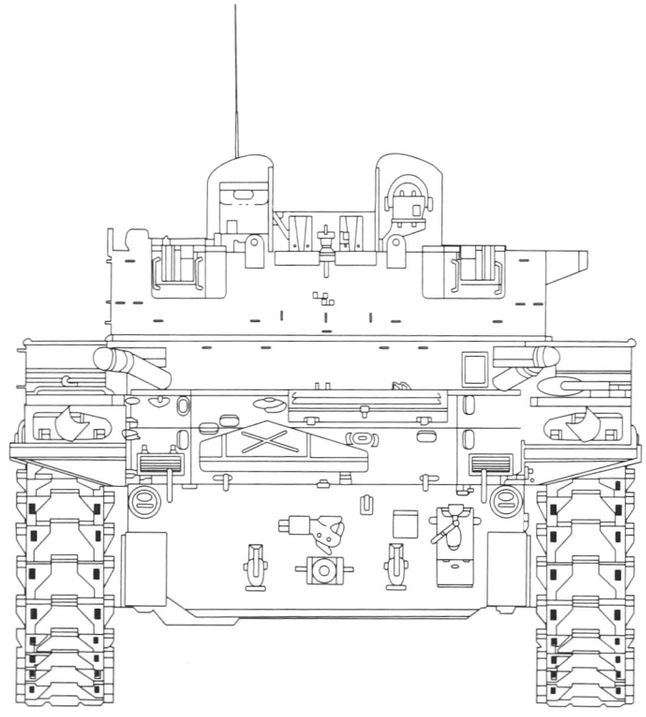
This Duster served with the Ohio National Guard in Columbus Ohio in 1982.

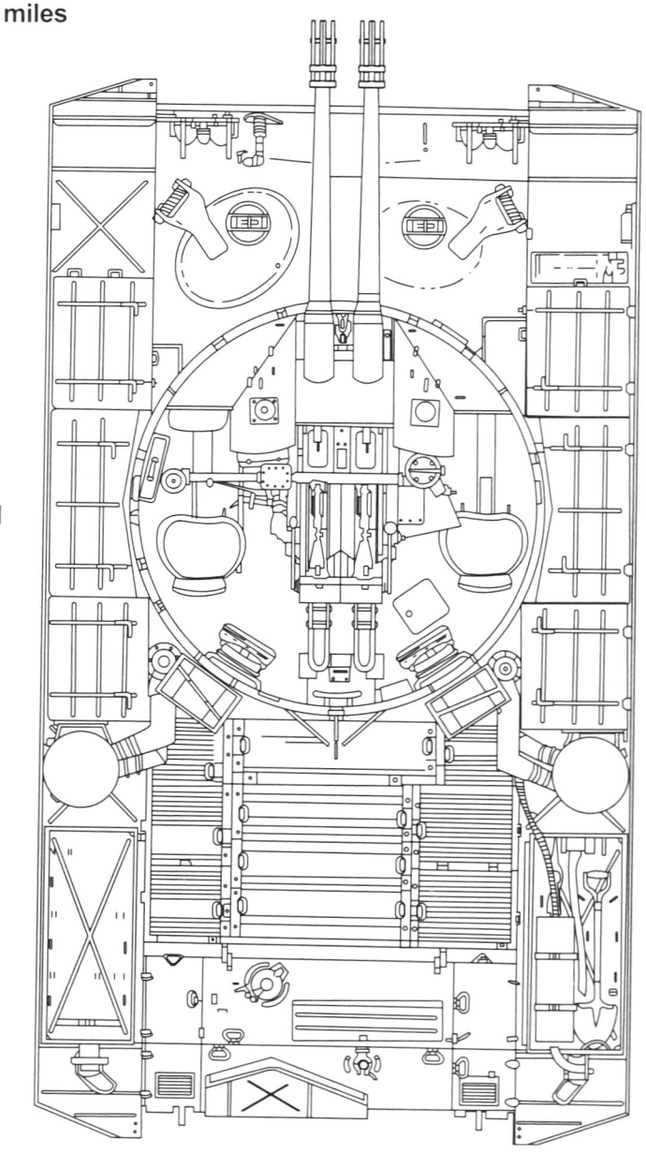


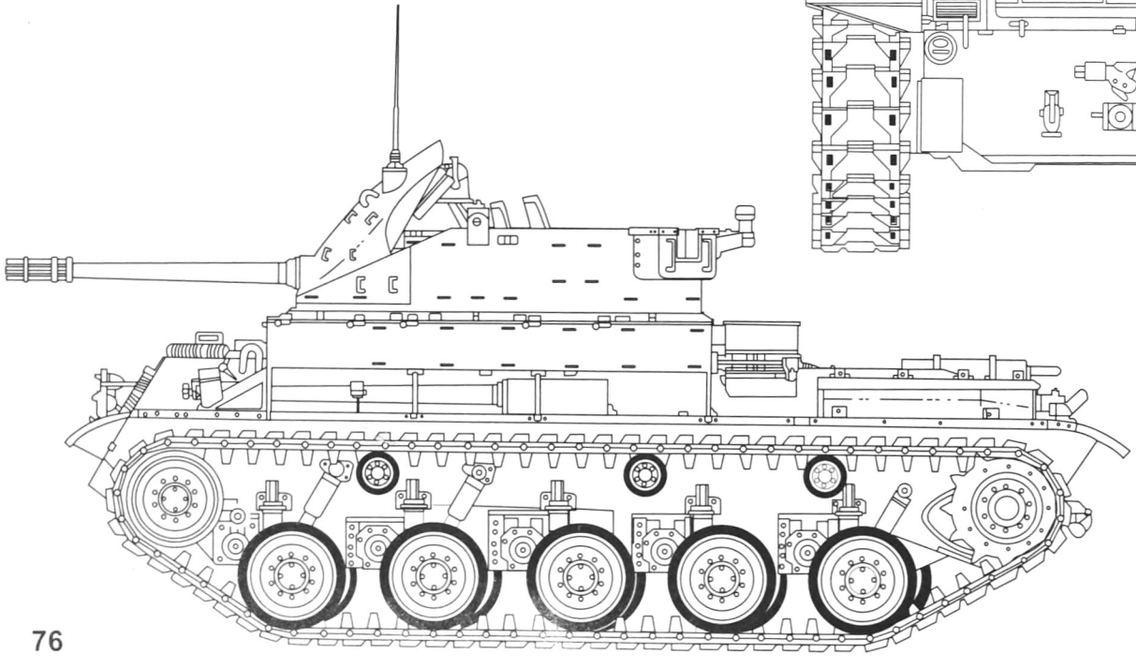
M42 Duster

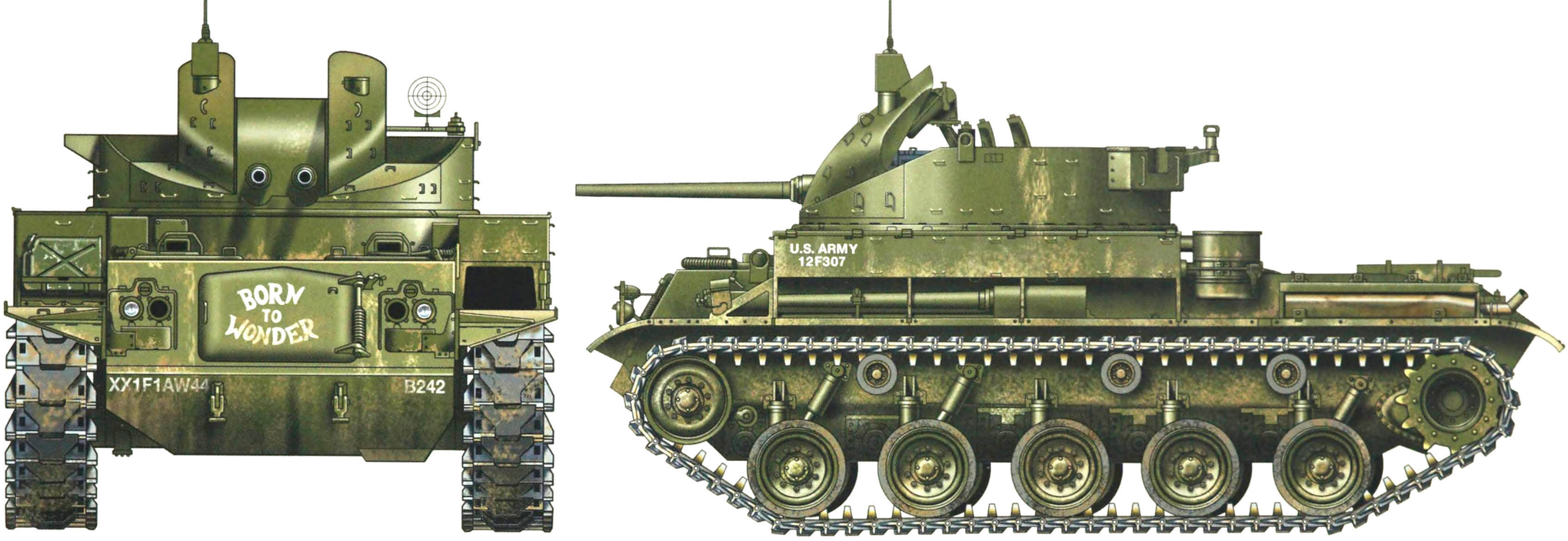
Crew	Five to Six
Length	20 feet, 9.6 inches
Width	10 feet, 6.9 inches
Height	9 feet, 4 inches
Weight	49,497 pounds
Main armament	Two 40 mm Bofors cannons
Engine	500-horsepower Continental AOS-895-3
Speed	45 mph
Range	100 miles





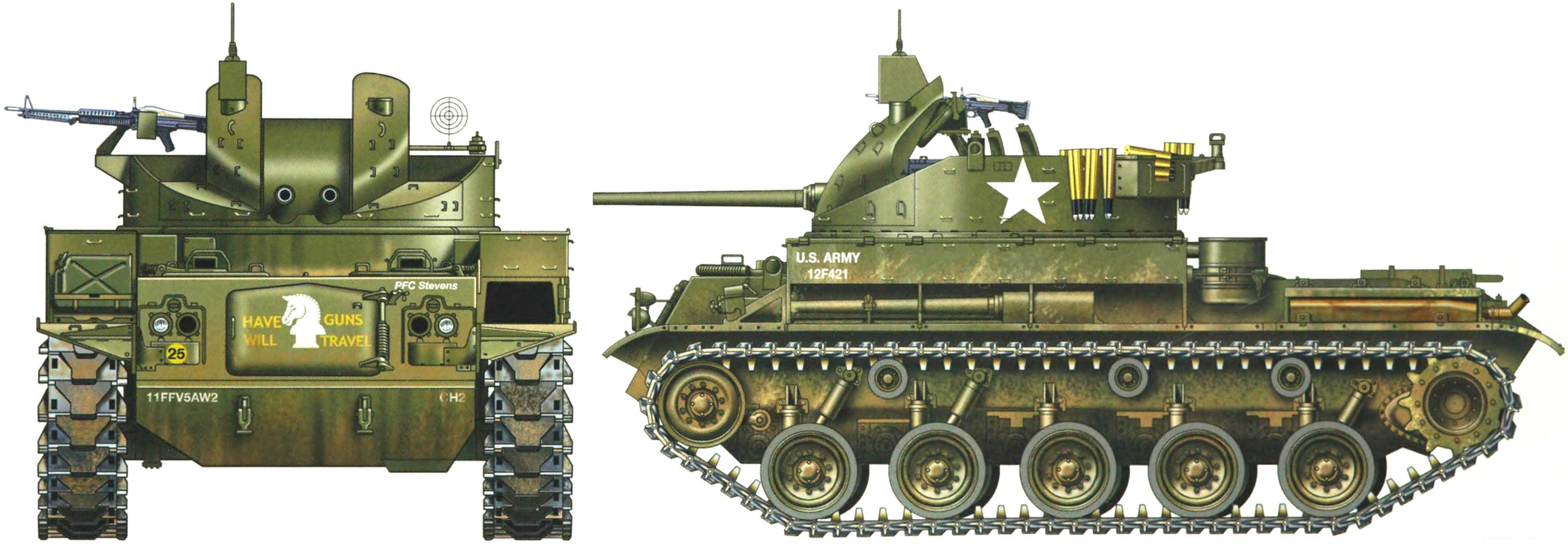


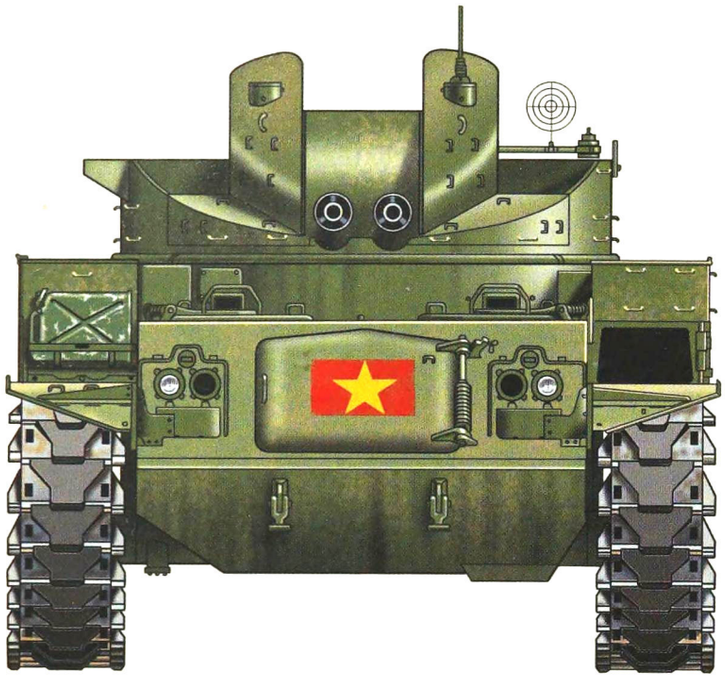


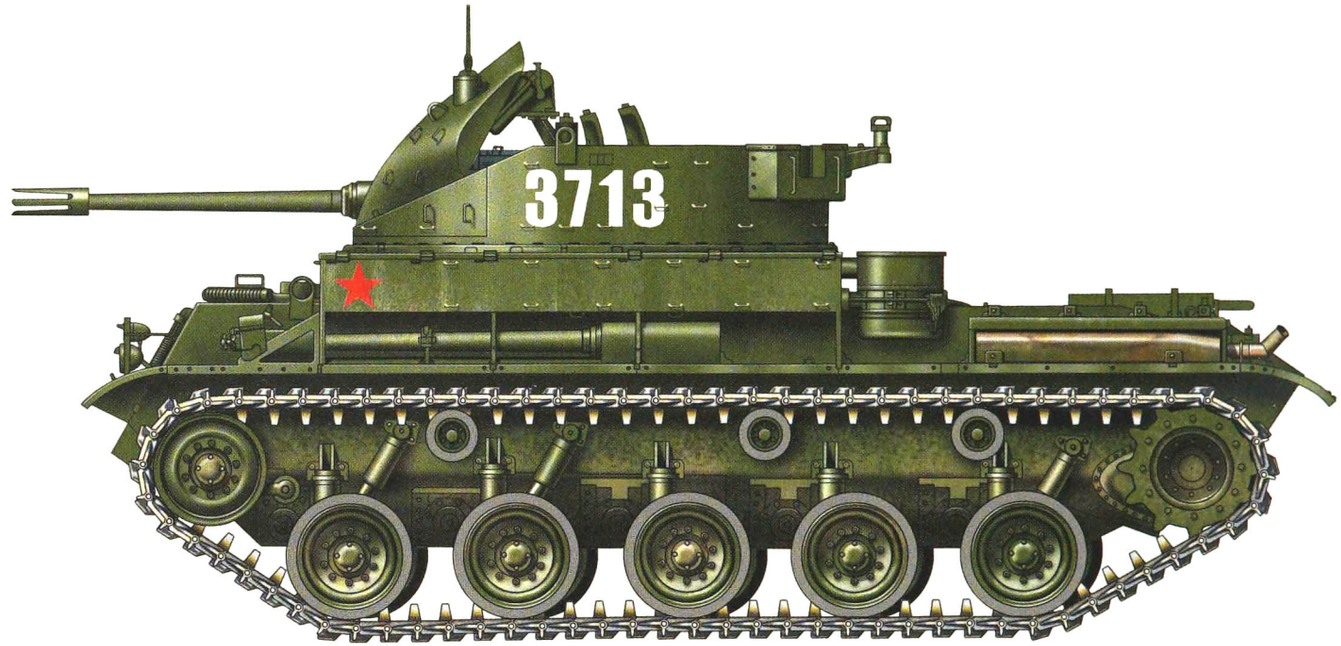


Born to Wonder was a 1st Battalion, 44th Artillery, Duster in 1968.

Have Guns Will Travel served with C Company, 5th Battalion, 2nd Artillery, attached to the 3rd Battalion, 17th Air Cavalry, in April 1970.

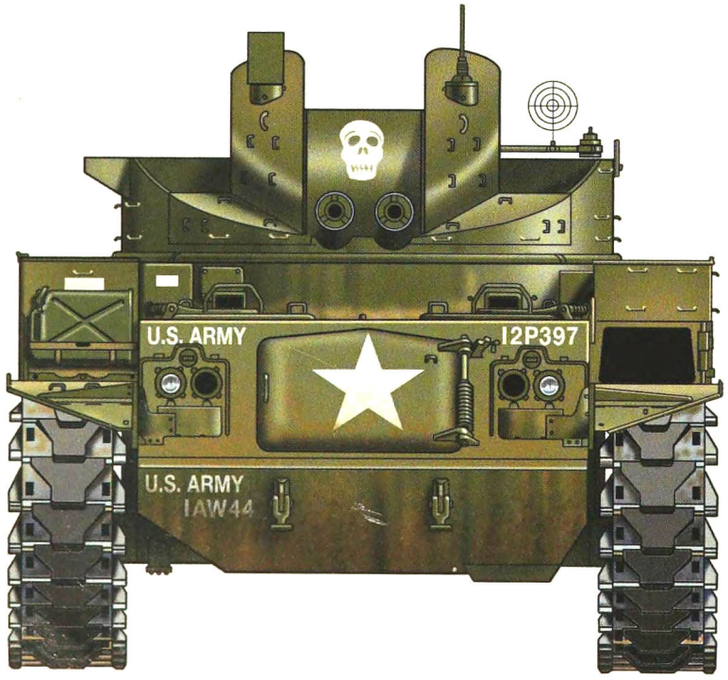


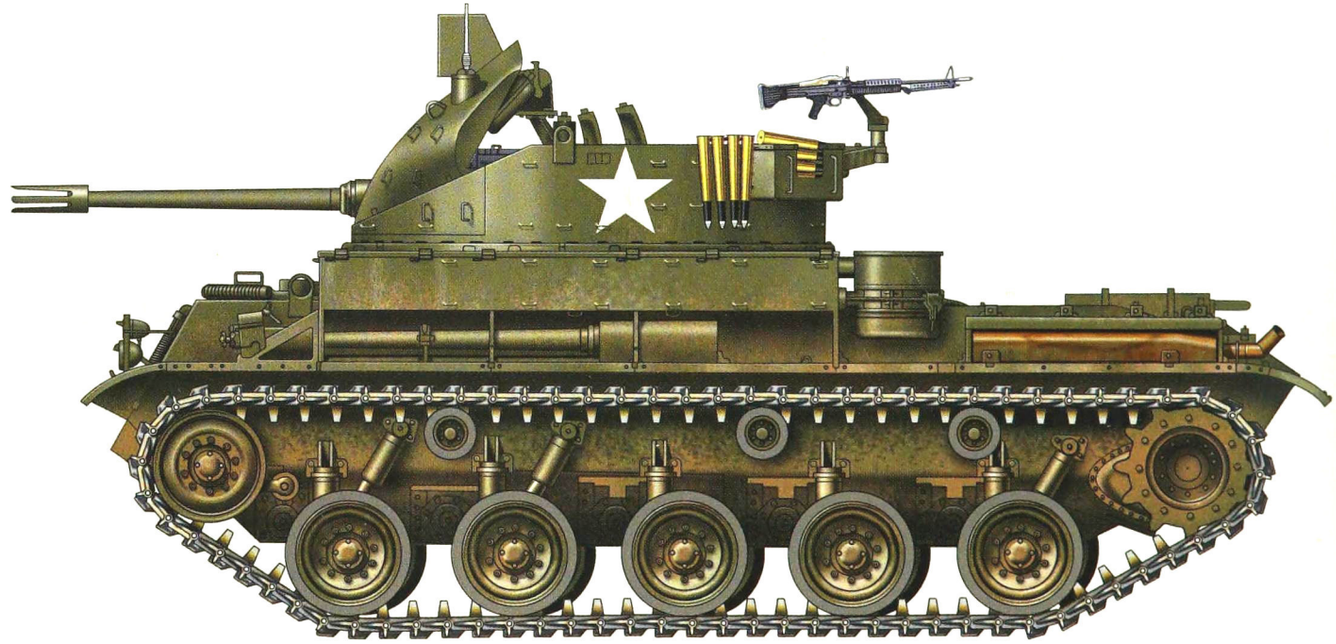


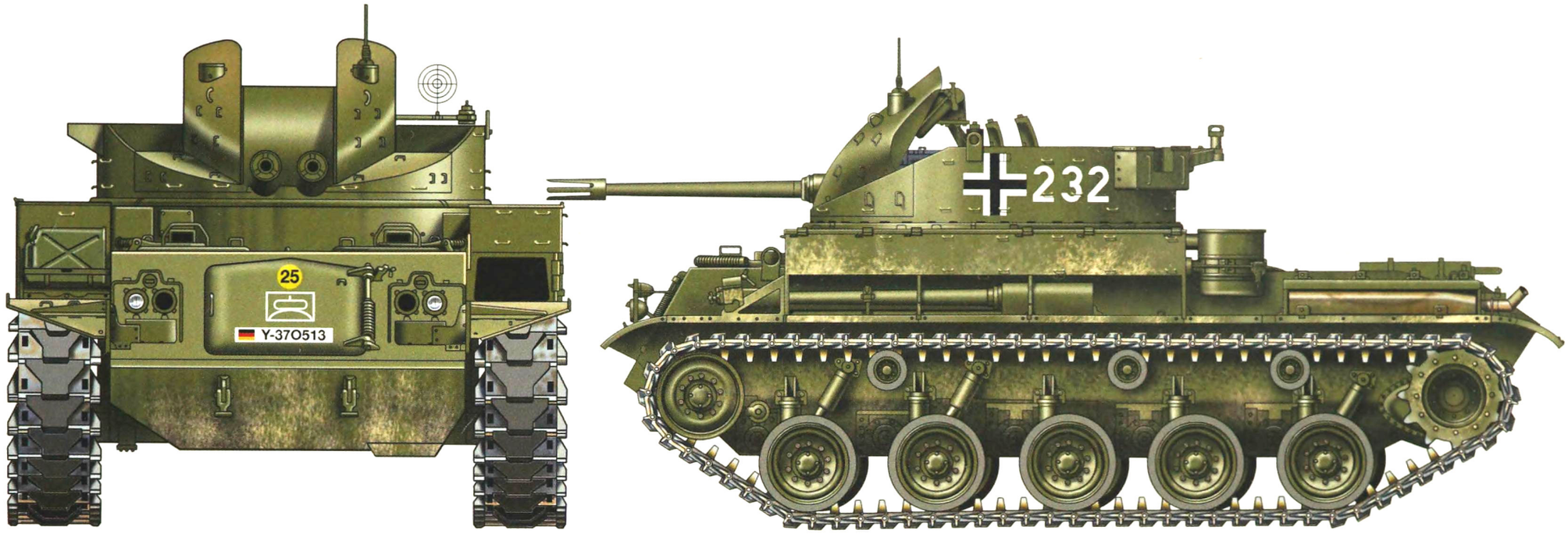


This M42A2 was captured and used by the Peoples Army of Vietnam in Da Nang in 1977.

This M42A1 served with the 1st Battalion, 44th Artillery, near Dong Ha, Vietnam, in 1969.

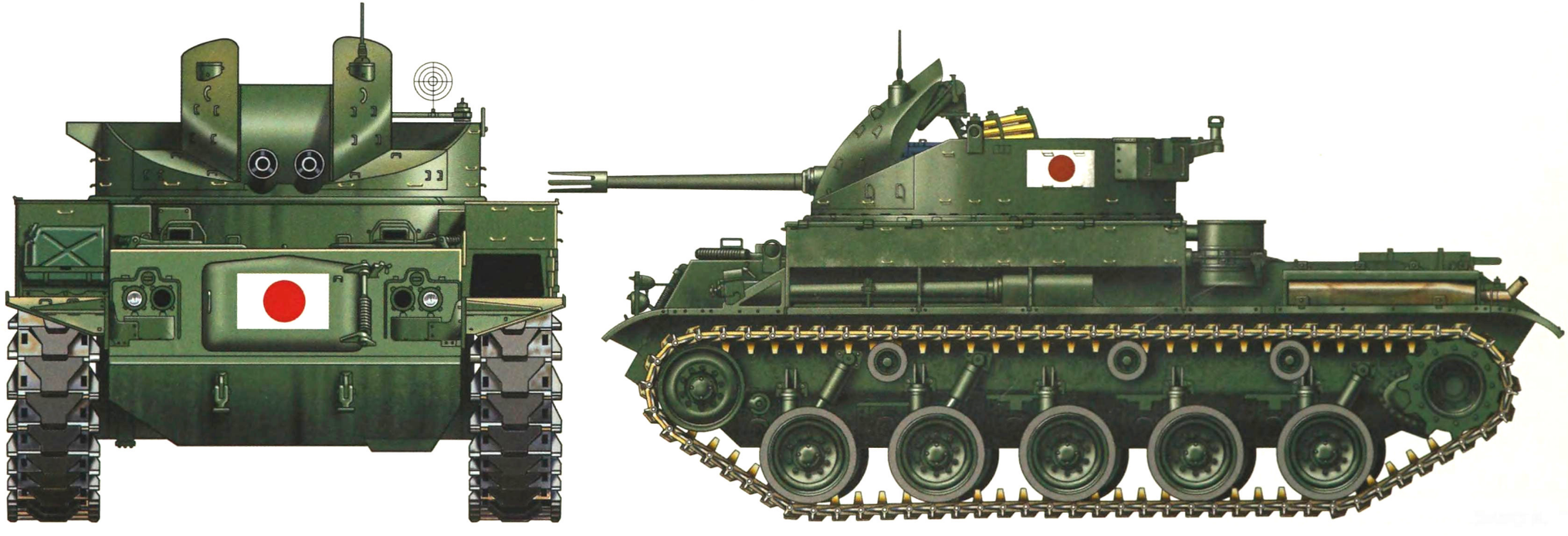


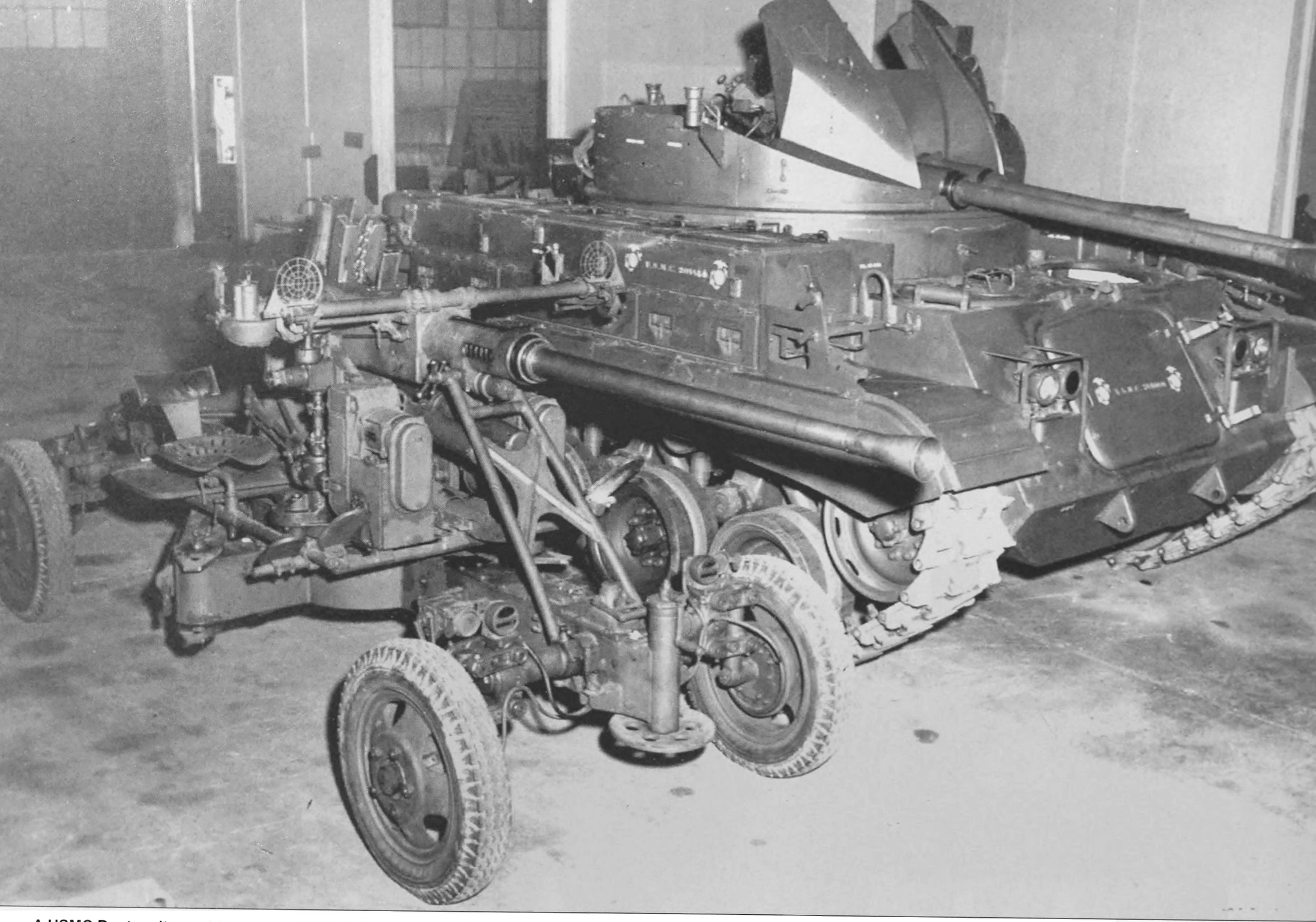




This Duster was in service with the Federal German Army in July 1973.

This Duster was stationed with the Japanese Self-Defense Force in Okinawa in 1970.





A USMC Duster sits next to a towed M2A1 Bofors cannon of WWII fame. The increased mobility and doubled fire power made the Duster a much more formidable weapon, but advances in aviation made the Duster largely obsolete in its intended role. (ADA Fort Bliss)

ISBN 978-0-89747558-7
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